PAINT and VARNISH Production

E TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

LATEST DEVELOPMENTS...

RARE EARTH DRIERS
IN BAKED FINISHES

SOLIGEN RARE EARTH NAPHTHENATE
HEXOGEN RARE EARTH OCTOATE

Observed Advantages:

a) Increased cross linking in molecular structure resulting in markedly tougher films

b) Wide range of activity at normal baking temperatures and cycles

c) Excellent color retention in baked films

d) Increased film hardness and toughness

e) Savings in cost by reducing amino resin additions

f) Improved water and soap resistance of film

g) Marked drying efficiency in baked films where other metallic driers have proved inefficient

h) Hexogen Rare Earth Octoate can be used where discoloration is the critical factor in the baked film

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FUNGICIDES
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PAINT DRIERS
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C TOBER
1952

REICHHOLD

RCI'S WALLKYD An Outstanding Vehicle for Flat Wall Finishes!

CHEMICALS

INEXPENSIVE . . . Wallkyd is as economical as a limed vehicle, yet it is a pure alkyd, free of lime, soaps, rosin and rosin derivatives.

EASY TO HANDLE . . . Dissolved in a low odor thinner, Wallkyd handles as easily as any conventional flat liquid and has the drying speed of an emulsion paint.

HIGHLY VERSATILE . . . With a single vehicle, Wallkyd, you can produce everything from flats to semi-gloss enamels. And by adding other RCI alkyds you can even formulate high gloss enamels for interior trim and woodwork. In addition, Wallkyd is ideal for sealers and undercoats, especially those designed for use under semi-gloss finish coats.

READILY APPLIED . . . Wallkyd-base flat wall enamels can be applied with rollers (either dipping or fountain type) or a four-inch brush – with no drag. They eliminate the long "tender" period in drying, and coat after coat of a Wallkyd finish can be applied without cracking, peeling or stripping. Wallkyd-base products wash readily without polishing or staining.

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Announcing a new paint thinner COMPLETELY ODORLESS!

SHELL SOL 72

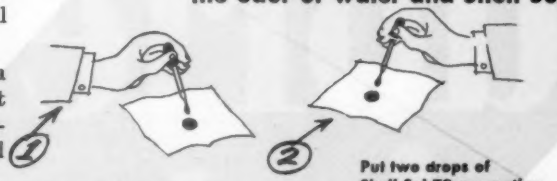
Helps overcome major complaint of paint odor . . . holds wet edge longer

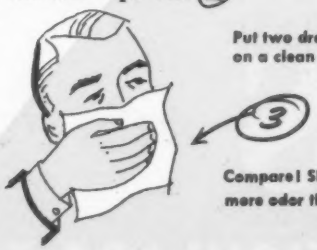
The good news among formulators today is the arrival of a new odorless thinner—Shell Sol 72. Available in full-scale production quantities now, Shell Sol 72 helps overcome one of the largest objections against interior oil paints—unpleasant paint odor.

What's more, Shell Sol 72 holds a wet edge longer . . . gives your paint smoother brushing qualities . . . reduces chances of tell-tale laps and brush marks.

MAKE THIS TEST

—see if you can distinguish between the odor of water and Shell Sol 72





TEST SAMPLE AVAILABLE

While we cannot currently meet the demand for Shell Sol 72, we want you to know about it. Drop us a note on your firm's letterhead, we will be glad to supply a one-gallon sample of Shell Sol 72 which you can test in your own laboratory.

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PAINT and VARNISH Production

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 42 OCTOBER, 1952 NO. 10

NEXT ISSUE

As you all know the Annual Paint Conventions and Paint Industries' Show will be held in Chicago the week of November 17th. In this connection, we wish to announce that the November issue of PAINT and VARNISH PRODUCTION will be an all convention number. Programs of the National Association and the Federation together with a listing of all exhibitors at the Paint Industries. Show will be included in this issue. As a special feature, we will present an interesting article on the engineering aspects of paint manufacturing. So be sure and see our November issue.

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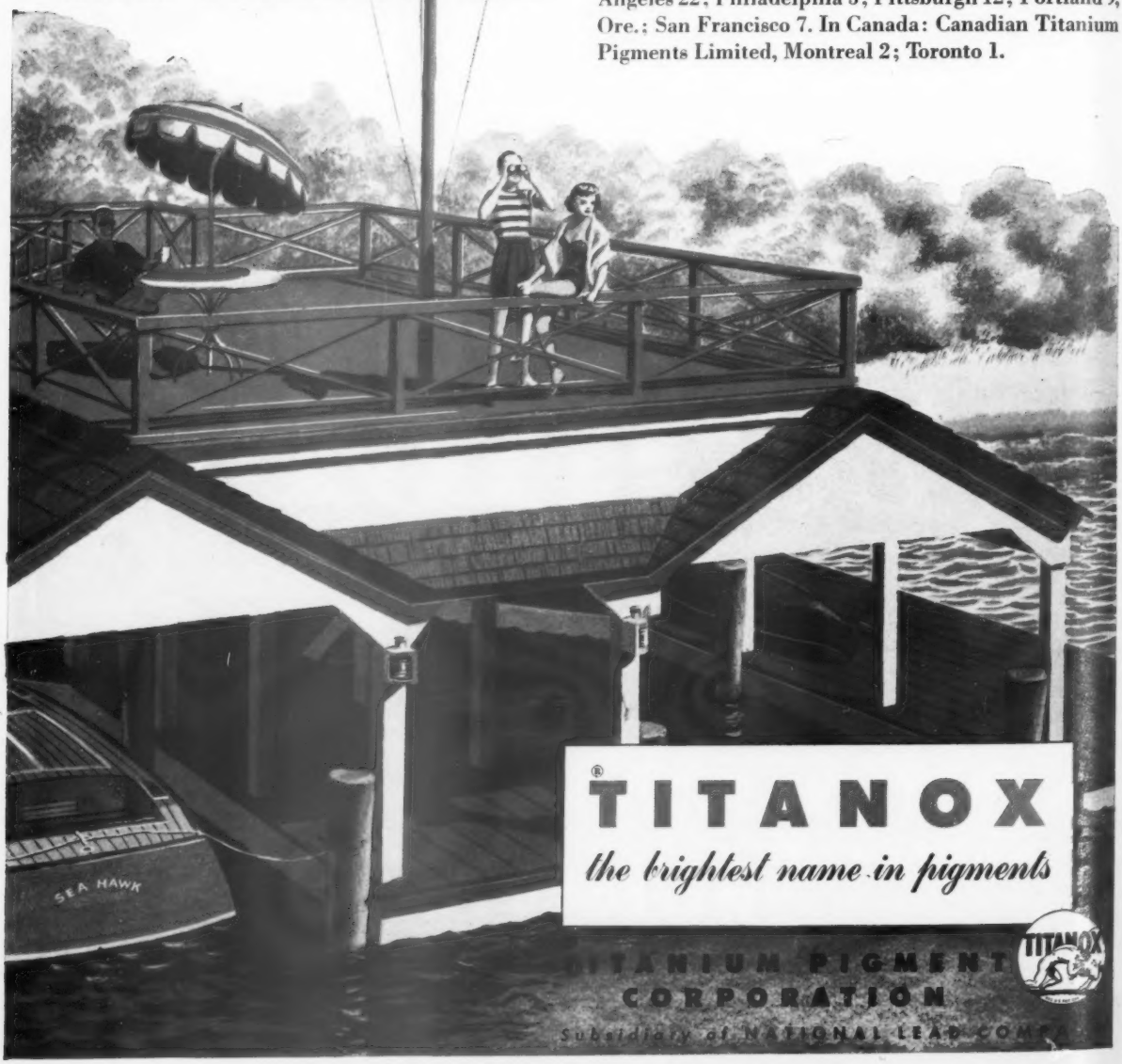
We welcome any opportunity to tell you more about TITANOX-RC. Ask your Titanox representative or write to Titanium Pigment Corporation, 111 Broadway, New York 6, N.Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.



About Our November Issue

NEXT month, the National Paint Varnish and Lacquer Association and the Federation of Paint and Varnish Production Clubs will hold their annual conventions in Chicago. In connection with these forthcoming meetings, PAINT AND VARNISH PRODUCTION takes pride in announcing that the November issue will feature an interesting presentation on the engineering aspects of paint manufacturing.

It can be said that up until a few years ago, the principles of chemical engineering made very little impact upon the paint industry. This was primarily due to the fact that the technical phases of paint manufacturing were dominated by chemists and production men with little or no engineering background. Another condition which retarded the application of engineering principles was the fact that paint manufacturing is exclusively a batch operation involving mixing, dispersion, filtration and material flow—mixing and dispersions being the most important steps.

Take for example the studies of pigment dispersion made by the Scientific Section of the National Association, completed about two years ago. The information and data collected in these studies have contributed greatly to the improvement and efficiency of ball and pebble mill operations. Similarly, the work of the technical service department of the Calco Div. of the American Cyanamid on the practical aspects of pigment dispersion produced a wealth of valuable information and data which can be readily applied to grinding operations in the paint plant.

The success by these and others points up the value of engineering research and should serve to inspire similar action in other areas.

This special presentation will deal with the two main engineering operations commonly used by the paint industry—mixing and dispersion. The approach will be strictly from the unit operation point of view, and every effort will be made to bring the reader up-to-date on these two techniques. Thus, the November issue will present the most significant advances in these two important phases of paint technology.

The Business of Fire Prevention

FIRE prevention is everybody's business. Through planning, construction and abiding by the practices prescribed by nationally recognized fire protection and engineering authorities, fire safety can be greatly enhanced.

However, preventive methods and construction cannot be completely effective unless they are backed by programs of maintenance, good housekeeping, and education.

Machinery and equipment must be operated in the manner for which it was designed, if failures are to be minimized. Continuous operation and overloading of equipment obviously run the risk of frequent breakdowns, and it is essential that one makes periodic inspections to ascertain whether the machine is approaching or exceeding its limitation, or approaching obsolescence, and undertake corrective measures to prevent failures. Thus, a preventive maintenance program is a "must" in any plant, since failure of machinery can be a source of fire hazard.

Another important element of fire prevention is good housekeeping. Rubbish and waste products are the sources of many fires in our plants today, and they should be kept in covered metal containers far removed from hazardous areas. Good housekeeping is also essential in keeping order and cleanliness and eliminates hazards to personnel, and removes obstacles which may hinder control and extinguishment of fire.

Undoubtedly, one of the most important factors in fire prevention and control is an active educational program on the science of fire fighting. Every employee should be trained in the basics of fire extinguishment. He should be able to operate all fire fighting equipment efficiently and effectively. In this connection, adequate maintenance of such equipment to insure proper operation cannot be over emphasized.

The individual must be impressed with the important role he has in a fire prevention program. The worker should be familiarized with operations within the plant and be instructed with corrective measures in the event of any abnormal conditions which may arise, and this should be readily available to the operator at all times.

The success of any fire prevention program is the result of hard work and cooperation by all, and with constant vigilance the occurrence of fires in your plant will be minimized greatly.

For Odorless Paints

NEW! ODOREX DRIERS

- Impart no odor to paints before, during or after drying.
- Equal in drying performance to other standard driers.
- Metal content guaranteed within ±0.1% by exclusive Nuodex certification.
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Specifically developed by Nuodex for odorless paint systems. Made from selected and specially treated fatty acids and odorless-type solvents.

Now available in the three most important metals:

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ODOREX MANGANESE—6%

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Free From Water Soluble Salts: EDGAR ASP 400 contains no ionic impurities that lead to breakdown of latex emulsion systems.

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Proven Performance: EDGAR ASP 400 was the pioneer inert of its kind in latex emulsion formulations and is now the most widely accepted and used inert in the field.

Reduces Your Costs: In addition to adding valuable qualities to your latex emulsion paints, EDGAR ASP 400 provides the plus value of reduced costs through its own low price 1⅛ cents per lb. in carload lots, f.o.b. McIntyre, Ga.) and its ease of formulation.

with Edgar ASP 400

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EDGAR ASP Products serve the paint industry in many other ways also. . . . A card or letter will bring you full information without obligation.

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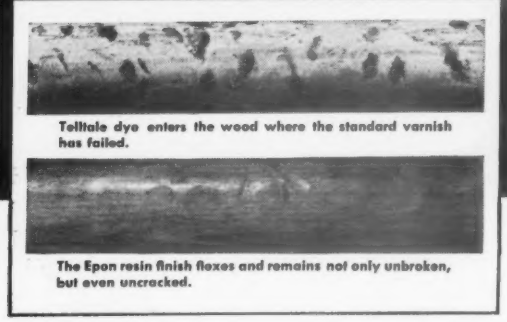
Please send me the following:

⬡ File folder with up to date technical literature
⬡ Sample drum of ASP 400 ⬡ 2 lb. ⬡ 5 lb. ⬡ 10 lb.

NAME _____ TITLE _____

FIRM _____ ADDRESS _____

Why only EPON® RESIN finishes can stand this abuse



Telltale dye enters the wood where the standard varnish has failed.

The Epon resin finish flexes and remains not only unbroken, but even uncracked.

YOU CAN EASILY MAKE this simple dowel test yourself!

The Set-Up. Coat two hardwood dowels with a standard brand of varnish. Coat another pair with an Epon resin-based finish. Age them, if you wish, to develop the maximum brittleness. Now strike them together, just as hard as you can. When you have done your worst, rub a "telltale" dye over the surfaces.

The Result. The standard varnish cracks and flakes . . . as emphasized by the dye penetration into the wood. The Epon resin finish *follows the dented surface without any sign of chipping, flaking or dye penetration.*

The Reason: The Epon Resin molecule is an entirely new class of polymer with evenly spaced reactive groups which permit it to cure to a flexible film. Also, its polar nature contributes outstanding adhesion. As a plus value, Epon resins have excellent resistance to detergents, caustic and many acids.

Write to your nearest Shell Chemical office for more information and samples.

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to new markets and long term protection

Corrosive cargoes haven't hurt this hopper car! It's covered with a tough, strongly adherent coating based on VINYLITE Brand Resins—good for added years of service—applied in only one day.

It's another example of the scores of new markets you can reach with paints based on VINYLITE Resins! Oil refineries, factories, dairies, public buildings, ships—all need the protection of coatings like this.

Properly formulated, properly applied, coatings based on VINYLITE Resins quickly dry to a film that resists oil, water, chemicals, weather extremes, thermal shock. They're nonflammable, odorless and tasteless—excellent for containers. They come in a wide range of colors—glossy, flat, or semi-luster—that are unchanged by repeated scrubbing and washing.

VINYLITE Resins can be compounded into your paints with standard equipment. They are being used throughout defense and industry. For further information about them, write Dept. NZ-75.

Data on the coating on this hopper car courtesy Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa.

Vinylite
BRAND
RESINS

TRADE MARK

BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
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Now available

in substantial quantities
for the manufacture of odorless
protective coatings . . .

AMSCO Odorless MINERAL SPIRITS

manufactured under rigid control
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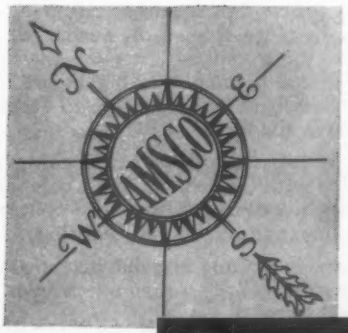

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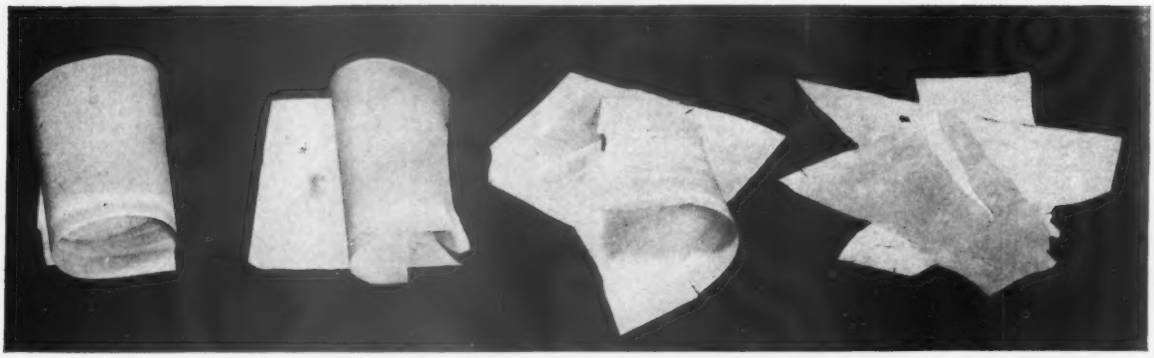
Complete technical data, prices and samples available on request

"lead"-stabilized house paints have sustained flexibility



The plasticizing effect of white lead in mixed pigment house paint formulations is demonstrated by this photograph. After undergoing artificial weathering for the same period an attempt was made to roll up these four stripped paint films (typical commercial formulations) of identical thickness. White lead content, left to right, is 35.0%, 20.0%, 12.5% and 0.0%.

"LEAD" LENGTHENS THE LIFE OF PAINT BECAUSE:

It Stabilizes . . .
neutralizes acidic compounds resulting from the decomposition of the vehicle—prevents the film from becoming soft or liquefying.

It Plasticizes . . .
forms lead soaps which increase film flexibility.

It Strengthens . . .
flexible, spiney lead soap particles mechanically reinforce the film and increase elastic strength.

It Resists Water . . .
paint films with an optimum lead pigment content absorb only a small fraction as much water as they otherwise would.

It Limits Oil Penetration . . .
more of the vehicle remains in the film where it is needed; less is absorbed in the substrata.

It Improves Appearance . . .
by controlling chalking and inhibiting mildew.

Another positive demonstration of the superior flexibility of white lead house paints over other types was recently conducted at the request of the White Lead Technical Committee of Lead Industries Association. The results, shown here, confirm those of other standard test methods, which consistently have indicated that the greater plasticity and stability of paints containing white lead result in a more flexible, longer lasting film.

"Lead" *stabilizes* paint by providing a means of capturing destructive acidic compounds as they form during the normal weathering of the vehicle. Left alone, these compounds soften the film, thus greatly shorten its life. In lead pigment paints they are immobilized, through their reaction with the pigment, to form useful, stable, insoluble lead salts in the film.

"Lead" *plasticizes* paint by forming spiney, interlocking (felted) lead soaps through reaction with the vehicle. These compounds are ideal plasticizers, allowing the film to adhere closely to surfaces, yet expand and contract under stress without cracking.

In short, "lead" paints provide a *strong* film that gets *stronger* with initial weathering . . . stays intact *longer* than other types.

For the formulation of these three test specimens, for test procedure, or for any information relative to the importance and use of white-lead pigment in house paints, write: ***Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y.***

Visit our booths Nos. 59 & 60 at the Seventeenth Annual Paint Industries' Show, Palmer House, Chicago, November 18 to 22, 1952.

1084

why gamble?

call a specialist... Arizona Chemical... for these economical fatty acids...

ACINTOL FA #1 is a more economical product which can be used for the same applications described below for FA #2. It is particularly advantageous where a darker color and slight rosin content can be tolerated.

ACINTOL FA #2 is the outstanding Tall Oil fatty acid for alkyd resins. It imparts excellent color stability, fast dry, good flexibility and adhesion to alkyd type finishes. Because of its non-yellowing characteristics it is especially suited for white baking enamels. ACINTOL FA #2 is also an excellent replacement and extender for higher-priced distilled fatty acids in such applications as soaps, detergents, textile specialties and lubricating greases.

Write today for samples and quotation.

ACINTOL* FA #1

for use where darker color and small rosin content can be tolerated...

Specifications:

Acid number	187-192
Linoleic acid	43%
Rosin acids	3-5%
Unsaponifiables	4-5%
Color (Gardner)	8-11

ACINTOL FA #2

for use where low unsaps and low rosin are essential...

Specifications:

Acid number	192-195
Linoleic acid	46%
Rosin acids	1.5% max
Unsaponifiables	2.7% max
Color (Gardner)	6-8

*Trade-mark

Producers of:
ACINTOL C Crude Tall Oil
ACINTOL D & DLR Distilled Tall Oil
ACINTOL P Tall Oil Pitch
ACINTOL R Tall Oil Rosin
ACINTOL FA #1 and FA #2 Tall Oil Fatty Acids

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For architectural flat paints...

A completely odorless new alkyd resin—

Syntex 141

Now, thanks to Syntex 141, you can formulate flat paints that are completely odorless and have all the advantages of alkyd resins—better sealing properties, hardness of dry, toughness of film, and uniformity of color.

By using Syntex 141 (for flat formulations) and a supplementary resin, Syntex 71 (for gloss) in your paints, you can also prepare odorless primer—sealers, undercoaters, deep-tone flats, semi-glosses, four-hour enamels, and floor paints.

Suggested formulations available for these odorless paints. Full production quantities available immediately. Write today for free samples. Address:

Jones-Dabney Company
Louisville 8, Kentucky

PHYSICAL CONSTANTS OF SYNTEX 141

Viscosity	Z_4 - Z_6 +
Wt/gallon	7.15 - 7.25
Solids	40%
Acid Value	15 - 25
Color	10 Maximum
Solvent	Odorless Mineral Spirits
Red. Viscosity	F - I @ 25% Solids in Odorless Mineral Spirits

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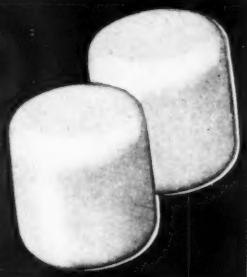
BURUNDUM

GRINDS FASTER...GRINDS FINER!



EXCERPT FROM FIELD REPORT No. 12:
"Substituting an equal volume of Burundum for flint pebbles in a 25 gal. mill, we ground a green tinting solution to a North Gage of 7.0 in 44 hours. With flint pebbles, this same job required 76 hours grinding."

EXCERPT FROM FIELD REPORT No. 47:
"We made a trial run with Burundum in a 115 gallon porcelain-lined mill. A companion mill was loaded with the same volume of berylite balls. Grind checks were made at periodic intervals. We ground three similar batches in each mill and Burundum ranged from 10-25% faster than the berylite."

EXCERPT FROM FIELD REPORT No. 81:
"I checked Burundum against porcelain balls in the grinding of a white lusterless enamel. I used equivalent size mills and equal charges of media. Volume of the grinding medium was 40% of the mill. Volume of the medium plus material charge was 65% of the mill. Burundum gave a North Gage Fineness of 6.0 in about 30 hours. The flint pebbles required more than 50 hours for the same grind."

EXCERPT FROM FIELD REPORT No. 34:
"We used 1000 lbs. of Burundum in each of two 3' x 3' Buhrstone lined mills. Certain batches which we produced in 48 hours with flint pebbles took only 24 hours with Burundum. On other batches we were able to increase consistencies to yield 20% larger batches and still obtain a good grind in 18-24 hours with Burundum."

EXCERPT FROM FIELD REPORT No. 31:
"Normally it took 90 hours to grind our zinc chromate primer. By substituting Burundum for flint pebbles, under the same conditions, we lowered the grind time to just 44 hours."

EXCERPT FROM FIELD REPORT No. 22:
"Using two mills, we made parallel grinds with equivalent volumes of flint pebbles versus Burundum. The same gray enamel was used in both cases. For the flint pebble grind, 80 hours were required for a North Gage of '6'. The same fineness was accomplished in only 42 hours with Burundum."

EXCERPT FROM FIELD REPORT No. 41:
"Before putting Burundum in our production mills, we ran preliminary tests in our laboratory. For the test, we used a chrome green which is about the most difficult pigment to grind that we use. The vehicle was an alkyd in VM & P solvents. Burundum ground the solution to a fineness of 8.0 (Production Club Scale) in exactly 50% of the time required for flint pebbles—23 hours as compared to 46 hours."

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U. S. STONEWARE
AKRON 9, OHIO
PROCESS EQUIPMENT DIVISION

Stabilization of Chlorinated Vinyl Polymers

By R. E. LALLY
Ferro Chemical Corp.

Wide variations in the structure of commercial vinyl chloride polymers and copolymers, and the increased range of application of such resins, has caused the problem of stabilization to become more complex. However, greater understanding of vinyl degradation reactions has made it possible to stabilize most resins for proper commercial application.

The effect of resin structure on processing and degradation is considered along with the basic causes of deterioration. The major classes of stabilizers are reviewed with data showing their relation activities in polyvinyl chloride and polyvinyl chloride-acetate resins.

Results of the use of Zinc compounds are shown in comparison to the activity of Cadmium compounds, and theories are advanced to explain the excellent action of such materials in both heat and light stabilization. Simple stabilizer systems employing the synergistic action of Cadmium and Zinc compounds with Barium and epoxy compounds are discussed, and data is presented illustrating the results of such activity.

THE COMMERCIAL application of all polyvinyl chloride resins requires the use of stabilizers. Because of the wide variations in the inherent stability of polyvinyl chloride resins and the variations in processing characteristics, the problem of stabilization has become rather complex. However, with increased understanding of the degradation mechanisms of such resins, it is now possible to obtain adequate stabilization of most commercial resins by the use of relatively simple stabilizer systems.

The structure of polyvinyl chloride may be represented by Figure 1.

The physical and processing properties of polyvinyl chloride may be varied by the degree of polymerization or by copolymerization techniques, permitting wider application of such resins.

Common copolymers in commercial use are the polyvinyl chloride-acetate and vinyl chloride-vinylidene chloride polymer represented by the structures as shown in Figure 2.

Such changes may result in wide variations in stability. Usually, as the molecular weight is reduced or the percent acetate or vinylidene polymer is increased, the stability of the resin is decreased. Since they may often be processed at lower temperatures than pure polyvinyl chloride resins, some reduction in thermal stability may be tolerated in copolymer resins.

Other factors which affect the stability of chlorinated polymers are (1) the presence of free chlorine or hydrogen chloride after polymerization, (2) the presence of free radicals as a result of polymerization and (3) the presence of additives used during manufacture of the resin to inactivate free chlorine hydrogen chloride, or free radicals. While the quantities of such additives are too small to give any protection during processing, they may influence the activity of stabilizers added during subsequent compounding.

Degradation Reactions

ALL polymers undergo degradation even at low temperatures, such changes becoming more apparent if the polymer is heated to high temperatures or acted upon by light energy.

Thus, when chlorine-bearing polymers are subjected to heat or light, the following reactions may take place to promote degradation:

1. Energy absorbed by the

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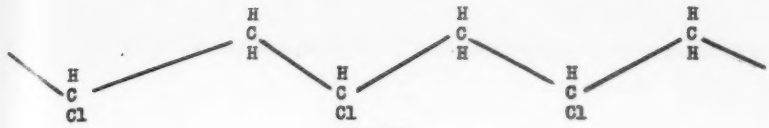


FIGURE 1

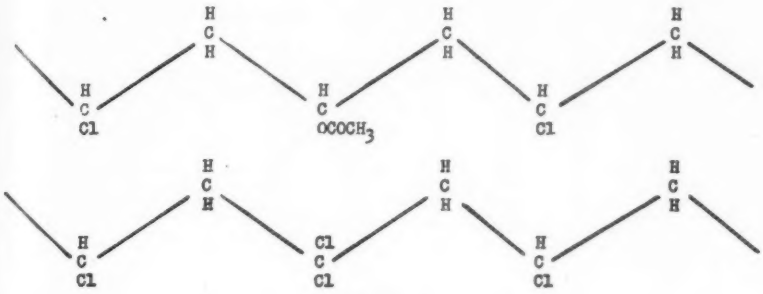


FIGURE 2

FIGURE 3

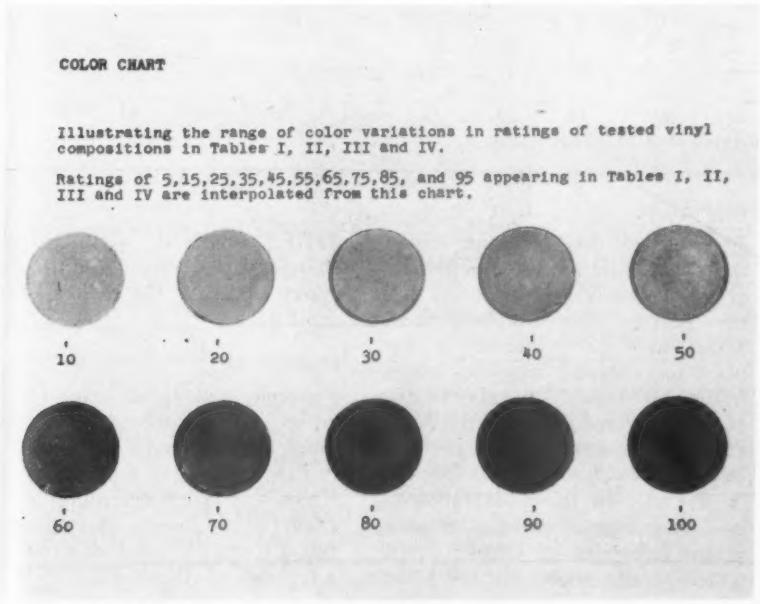


FIGURE 4

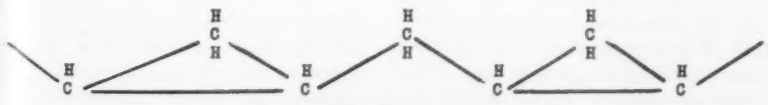


FIGURE 5

polymer molecule may cause the splitting off of hydrogen chloride.

2. Free hydrogen chloride thus formed may cause further breakdown by catalytic action.
3. Double bonds, formed by the liberation of hydrogen chloride, give weak points within the molecule at which long chains may degrade to form shorter chains.
4. Oxidation of double bonds results in discoloration and embrittlement.
5. Ultraviolet light, acting on double bonds formed during heat processing, accelerates embrittlement.
6. Free radicals may be formed, and may promote chain reactions resulting in depolymerization and cross linkages between resin molecules.

The basic degradation process is, therefore, a random splitting out of hydrogen chloride. This free hydrogen chloride causes the further stepwise removal of additional hydrogen chloride resulting in the formation of polyene systems. Such polyene systems give increasing color to the resin as the number of unsaturated bonds increase in a given molecule.

The oxidation of such polyene groups may result in free radical formation with resulting chain depolymerization.

The heat degradation of polyvinyl chloride gives a molecular structure as shown in Figure 3.

The initial color is rather light with a rapid change through, yellow, orange, red to brown. Such color change indicates a progressive increase in the number of polyene groups.

Testing of Stabilizers

WHILE several physical changes may occur as a result of the deterioration of polyvinyl chloride resins, change of color is generally used as a guide to the degree of degradation. Thus, if a material prevents color changes in a compounded resin under the action of heat or light, it is assumed to have stabilizing activity.

Before going into the discussion of materials used as stabilizers, it may be well to review the methods

TABLE I

Effect of Commercial Stabilizers on the Heat Stability of Polyvinyl Chloride

Polyvinyl Chloride 100 parts
Dioctyl Phthalate 50 parts
Stabilizer 3 parts
Oven Tested @ 350°F., Color Rating @ 15 Min. Intervals

No.	Stabilizer	Heat Stability Rating								
		Original	15 Min.	30 Min.	45 Min.	60 Min.	75 Min.	90 Min.	105 Min.	120 Min.
1	None	5	80	90	95	100	—	—	—	—
2	Sodium Organo-Phosphate Complex	10	60	80	90	95	100	—	—	—
3	Strontium Naphthenate	5	40	60	80	90	100	—	—	—
4	Calcium Ricinoleate	5	30	40	60	70	80	85	90	95
5	Barium Naphthena	5	25	55	85	95	100	—	—	—
6	Barium Ricinoleate	5	45	60	70	80	90	95	100	—
7	Lead Stearate (Basic)	10	20	25	30	35	40	55	70	80
8	Lead Silicate (Ortho)	10	20	30	40	50	60	70	80	90
9	Cadmium Octoate	5	5	90	95	100	—	—	—	—
10	Cadmium Ricinoleate	5	25	35	45	50	80	100	—	—
11	Zinc Octoate	5	100	—	—	—	—	—	—	—
12	Dibutyl Tin Dilaurate	5	20	45	55	60	70	100	—	—
13	Epoxy Compound*	5	60	75	80	85	90	95	100	—
14	1.5% Barium Ricinoleate 1.5% Cadmium Octoate	5	25	35	40	45	55	60	70	85
15	1% Barium Ricinoleate 1% Cadmium Octoate 1% Epoxy Compound*	5	15	20	25	30	35	40	45	50
16	1% Barium Ricinoleate 1% Cadmium Octoate 1% Epoxy Compound* 0.5% Sodium Organo-Phosphate	5	20	25	30	35	40	50	60	75
17	1.5% Cadmium Octoate 1.5% Epoxy Compound*	5	5	5	5	40	90	95	100	—
18	2.7% Calcium Ricinoleate 0.3% Zinc Octoate	35	1—	30	50	70	80	85	90	95
19	1% Barium Ricinoleate 0.5% Zinc Octoate 1% Epoxy Compound*	5	15	20	25	30	35	40	45	50

*High Molecular weight Condensation Product of Epichlorohydrin

of testing stabilizer systems. Heat and light tests are of prime importance to all processors of vinyl resins, although tests of opacity, moisture resistance and toxicity are often included in the evaluation of stabilizer systems.

Heat Tests

Oven Test. The oven heat test has proven most desirable for preliminary testing of stabilizer systems. In this case, the milled sheet is cut in strips and suspended in a warm air oven at temperatures near those encountered in processing. Color readings are made at predetermined intervals. It has been found useful to run a control with each test of a new system, since slight changes in oven conditions may give erratic results.

Platen Test. The platen heat test is felt by many to give results representative of extrusion conditions. In this test the milled sheet is held between heated platens at 350°F for 30 minutes. It has been noted that a stabilizer system which was rated inferior in the oven test showed superior results in the plated test. This may be due to the differences in activity of stabilizer systems in respect to oxygen.

Mill Test. In the mill testing of new stabilizer systems, the compound is banded on a two roll mill at temperatures between 300°F and 325°F. Sample patches are removed periodically for color comparison to standards.

While the mill test has been considered by many processors to be the only heat test representative of plant calendering conditions, recent tests made by the author and co-workers have shown that systems milled for two hours at 325°F compared well in color changes with oven tests on the same systems run at 325°F in a forced draft oven.

Light Tests

Accelerated light tests run in either the fadometer or weatherometer have proven very useful in in the screening of light stabilizers. Color, exudation or embrittlement may be the means of evaluation, but it is usually assumed that when any one of these changes takes place the stabilizer has lost effectiveness.

In light tests, the type of backing used for the sample support is very important. Recent tests in the author's laboratory were made using white, black and open supports for such exposures. The black background caused the most rapid color change, the open sup-

TABLE II

Effect of Commercial Stabilizers on the Heat Stability of Vinyl Chloride-Acetate Copolymer

Vinyl Chloride-Acetate Copolymer	100 parts
Dioctyl Phthalate	50 parts
Stabilizer	3 parts

Oven Tested @ 325°F., Color Rating @ 15 Min. Intervals

No.	Stabilizer	Heat Stability Rating								
		Original	15 Min.	30 Min.	45 Min.	60 Min.	75 Min.	90 Min.	105 Min.	120 Min.
1	None	15	55	75	85	85	90	95	100	—
2	Sodium Organo-Phosphate Complex	10	20	25	30	30	35	40	50	50
3	Strontium Naphthenate	10	35	40	45	50	55	65	80	90
4	Calcium Ricinoleate	5	15	20	25	30	45	50	55	65
5	Barium Naphthenate	5	15	25	35	55	65	90	100	—
6	Barium Ricinoleate	5	25	30	40	50	55	60	75	85
7	Lead Stearate (Basic)	5	5	10	10	10	15	20	30	40
8	Lead Silicate (Ortho)	10	20	30	40	50	60	70	80	90
9	Cadmium Octoate	5	30	100	—	—	—	—	—	—
10	Cadmium Ricinoleate	5	10	15	20	25	30	70	100	—
11	Zinc Octoate	5	100	—	—	—	—	—	—	—
12	Dibutyl Tin Dilaurate	5	5	10	10	20	25	30	40	100
13	Epoxy Compound*	5	30	35	40	50	55	60	80	85
14	0.5% Barium Ricinoleate 0.5% Cadmium Octoate 2.0% Epoxy Compound*	5	5	5	10	15	20	30	35	50
15	0.5% Barium Ricinoleate 0.5% Cadmium Octoate 2.0% Epoxy Compound* 0.5% Sodium Organo-Phosphate	5	5	10	15	20	70	100	—	—
16	1.0% Barium Ricinoleate 0.3% Zinc Octoate 1.7% Epoxy Compound*	5	5	5	10	15	60	95	100	—
17	2.7% Calcium Ricinoleate 0.3% Zinc Octoate	5	20	25	40	65	85	90	95	100

*High Molecular Weight Condensation Product of Epichlorhydrin

port giving the least change, with the white being intermediate. Tests reported in this discussion are those obtained using a white background.

It has been shown that compounded resins, which are poorly heat stabilized, will be more difficult to stabilize against light degradation. This is explained by the fact that deterioration reactions, started by heat energy, may give reaction points in the resin molecule where light energy can cause degradation and cross linkages between degraded molecules.

Commercial Stabilizers

SINCE several reactions take place during the degradation of chlorinated polymers, it is reasonable that no one stabilizer will be entirely satisfactory for the stabilization of such polymers under all conditions. As a result, many types of compounds are available for use as stabilizers.

The main classes of materials proposed as stabilizers are the organic and inorganic salts of the alkali metals, the alkaline earth metals and the heavy metals, as well as pure organic compounds which are capable of reacting with hydrogen chloride, double bonds, free radicals, or oxygen.

Since it is impractical to discuss in detail all the commercial stabilizers available on the present market, Tables I and II include only those which illustrate differences in degree of activity of basic types.

Nearly all other commercial stabilizers are modifications of those listed. It should be kept in mind that wide variations in metal contents, solvents, and organic constituents are possible, and that such changes in composition may affect the activity to a considerable extent.

In the results reported in Tables I, II, III and IV, color ratings were determined by comparison to the color changes in the *Color Chart* Figure 4. While a photograph of this color chart is not entirely satisfactory, it does illustrate the general degree of color increase obtained in the heat testing of most vinyl chloride resins.

While the photograph shows changes from colorless through gray to black, the actual films change from colorless through yellow, orange, brown to black.

It should be kept in mind that the results of these tests are relative, and that the same tests run under other conditions may not agree entirely with those shown.

The heat tests were run under the conditions described under *Oven Tests*. Color readings were made every 15 minutes over a period of two hours. The light tests in Tables III and IV were

TABLE III

Effect of Commercial Stabilizers
On the Light Stability of Polyvinyl Chloride

Polyvinyl Chloride	100 parts
Dioctyl Phthalate	50 parts
Stabilizer	As noted

Light Tested in National X1A Weatherometer, No Water Spray

No.	Stabilizer	Light Stability Ratings			
		Original	400 Hrs.	600 Hrs.	1000 Hrs.
1	None	5	90	100	—
2	1% Barium Ricinoleate 1% Cadmium Octoate 1% Epoxy Compound*	5	20	85	100
3	1% Barium Ricinoleate 1% Cadmium Octoate 1% Epoxy Compound* 0.5% Sodium Organo-Phosphate	5	10	15	20

*High Molecular Weight Condensation Product of Epichlorhydrin

obtained in a National X1A Weatherometer without water spray. The temperature of the air in the weatherometer was 115°F to 125°F.

Alkali Metal Salts

The alkali metal salts are rather ineffective as heat stabilizers, but sodium phosphates have proven useful in the light stabilization of chlorinated polymers. Several types of sodium phosphates are available, varying in heat stabilizing activity, but all are promoted as light stabilizers.

While the use of sodium phosphate as a heat stabilizer (Item 2, Tables I and II) shows little improvement over no stabilizer, its strong activity in preventing light degradation is well illustrated in Tables III and IV.

Alkaline Earth Metal Salts

Strontium, Calcium and Barium compounds have been used for a number of years as stabilizers. The Barium salts are most prominent in present commercial applications although non-toxic applications usually require the use of Calcium salts. While some use is made of inorganic salts of these metals, the organic salts have proven to be more useful.

Wide variations have been noted in the action of Barium soaps of different organic acids. Barium Ricinoleate, while giving a greater degree of yellowing in the early part of the heat cycle, will not darken as rapidly as does Barium Naphthenate.

This activity of Barium Ricinoleate may be due to the structure of the organic portion, permitting inactivation of products of degradation other than hydrogen chloride.

Heavy Metal Salts

Of the heavy metal salts Lead, Cadmium and Tin have proven most useful in general applications.

Lead compounds have the disadvantages of high toxicity, opacity and discoloration in the presence of sulfur bearing compounds, but their excellent electrical properties and low cost are of advantage in many applications.

As in the case of Barium, it is possible to change the activity of Cadmium by variations in the organic acid used. Thus, while Cadmium Octoate gives good stability of only 15 to 30 minutes, the ricinoleate holds a medium yellow color for about 60 minutes.

Tin soaps, in particular the dibutyl tin dilaurate, have the advantage of offering good clarity to vinyl films. Their main disadvantage is high cost per unit of activity.

Organic Compounds

Amine, phenolic and epoxy compounds have been used as stabilizers. Of the pure organic compounds, the epoxy types, due to their strong synergistic action with Barium and Cadmium, have found greatest commercial application.

Synergism

ONE of the most important developments in the stabilization of polyvinyl chloride has been the discovery of the synergistic action between compounds differing in stabilizing activity.

The original work in this direction indicated strong synergistic activity between alkaline earth metal salts and cadmium salts.

More recently, this work, employing synergism, has been carried a step further to give still greater improvement in stability. In such cases, three way combinations of

(*Turn to page 64*)

TABLE IV

Effect of Commercial Stabilizers
On the Light Stability of Vinyl Chloride-Acetate Copolymer

Vinyl Chloride-Acetate Copolymer	100 parts
Dioctyl Phthalate	50 parts
Stabilizer	As noted

Light Tested in National X1A Weatherometer, No Water Spray

No.	Stabilizer	Light Stability Ratings			
		Original	400 Hrs.	600 Hrs.	1000 Hrs.
1	None	15	95	100	—
2	0.5% Barium Ricinoleate 0.5% Cadmium Octoate 2.0% Epoxy Compound*	5	15	40	100
3	0.5% Barium Ricinoleate 0.5% Cadmium Octoate 2.0% Epoxy Compound* 0.5% Sodium-Organo Phosphate	5	15	15	20

*High Molecular Weight Condensation Product of Epichlorhydrin

Glycerine Paces Paint Progress

By E. SCOTT PATTISON
Glycerin Producers Association

PAINT technologists are well aware of the high position held by glycerine as a raw material for the production of protective and decorative coatings. For more than a quarter of a century — the period during which the modern industry has developed — glycerine's usage has steadily increased with the constant expansion of the paint field. Not only has the utility of glycerine grown in volume, but it has been greatly diversified to meet the demands of progress.

Back in 1940, Government statistics showed that about 28 million pounds, or nearly 20 per cent of the total glycerine production, was used in the manufacture of synthetic resins and ester gum. A decade later this figure had risen to 70 million pounds and it was estimated that approximately one-third of all the glycerine produced in this country was consumed in the manufacture of alkyd resins, ester gum and related products.

Resin Products

It may be said that the modern era in paint technology began with the introduction of ester gum, which has been called the first important contribution of the synthetic resin chemist. A product of the reaction of rosin (abietic acid with glycerine, ester gum made possible the development of uniform vehicles having properties far superior to those previously possible with rosin base products. Ester gum varnishes are low-priced, neutral, water-resistant (when made with tung oil) and fast-drying as compared with natural resin varnishes. Although other, often superior synthetic resins have since been developed, ester gum still finds extensive use. More than 23 million pounds of ester gum, made by esterifying rosin with glycerine, were produced in 1949.

Substantial quantities of other rosin modifications were also produced during that year, showing that rosin has continued to be the subject of considerable study. One recent result of such study was the development of so-called resinous alcohols, reaction products of rosin, glycerine and fatty acids. Resinous alcohols contain free hydroxyl groups, contributed by the glycerine, and reactive conjugated double bonds. Their principal reactions are esterification by acids or anhydrides, and addition with reagents such as maleic anhydride. Resinous alcohols are viscous, non-crystallizing liquids, soluble in many organic solvents and compatible with fatty acids and fatty oils. The physical and chemical properties of the materials suit them particularly for use in high

Mixing a batch of alkyd-base paint.

quality varnishes and alkyd resins.

Of related interest are the potentialities of the tall oil esters of glycerine. The rosin fraction of tall oil consists of about 70 per cent rosin acids and 30 per cent fatty acids; making it an excellent raw material for protective coatings. It has, therefore, been combined with glycerine to form varnish bases, in which it may be substituted for rosin up to 50 per cent without affecting the performance of the coating. (1)

Aside from rosin, other natural resins have benefited from combination with glycerine. Thus, to make a material suitable for use in lacquers, copal resin is dissolved in linseed fatty acids. Linseed oil is then added and the mixture is esterified with glycerine. The resulting alkyd-like product is lightfast and is said to be particularly suitable for tin can lacquers. (2)

The major application of glycerine, however, from the standpoint of its utility in relation to paint progress, is in alkyd resins, the "backbone" of most of today's finishes. Tremendous strides have been made in improving the quality and increasing the versatility of the alkyds during recent years, and they have helped to advance some of the newest synthetics, notably urea- and melamine-formaldehyde resins and finishes based on rubber latices. Horizons for alkyd resins are broadening, and it has been estimated that production of alkyds may reach 400 million pounds in 1952 and may go to 500 million pounds in 1954.

Versatility

In spite of the simplicity of the basic alkyd reaction, there is probably no other class of resins that is capable of such wide variations in physical properties and applications. The three basic constituents of oil modified alkyd resins, namely polyhydric alcohol, dibasic acid and fatty acid, offer the chemist an intriguing number of permutations and combinations for resins with many different properties. The picture can be simplified by regarding the usual type of alkyd resin as the chemical combination of glycerine, phthalic anhydride and oil fatty acids. Even when the composition of a resin is limited to these ingredients, it is possible to make an infinite variety of resins by varying the proportions of the raw materials, the kinds of oils, and the processing conditions.

Probably the greatest single factor that has made glycerine the predominant polyalcohol in the alkyd field is the ease with which its reactions can be controlled. It can be cooked longer than its more highly functional counterparts, without undue danger of gelation, to yield vsicous resins of low acid number, such as those required for flat architectural finishes. By varying the control, similar reactions can be made to yield low viscosity pure oil alkyds such as those that have recently found application in latex paints. The flexibility in formulations made possible with various oil-modified glyceryl phthalate resins greatly simplifies the task of meeting a wide range of specifications with the fewest variables and the least experimental trial-and-error.

The application of a glycerine-utilizing alkyd is largely determined by its "alkyd ratio", or the proportion of glyceryl phthalate present in the resin. (3) The highest alkyd ratio ordinarily found in commercial products is about 65. With such resins, viscosity is very high and aromatic solvents are required. These alkyds are used as hardeners for other alkyds of higher oil content. At alkyd ratios of about 50, viscosity is still high and aromatic solvents are also required. These resins are used as vehicles for baked coatings for such items as Venetian blinds, metal cabinets, can, caps, and automobiles.

When the alkyd ratio is reduced to about 40, the viscosity is lower and solubility in aliphatic solvents is attained. These resins are usually applied by roller-coating or spraying. They find wide application in air-drying pigmented enamels, maintenance paints, metal decorating, auto and truck refinishing, and sign painting. At alkyd ratios of about 30, viscosity is still lower, and the enamels made with these resins are well suited to brushing. They are used in architectural finishes, as trim and trellis paints, and where coatings of high flexibility are needed as, for example, on toothpaste tubes. The high durability of this type of alkyd was of particular value in

marine finishes during World War II.

Properties and Uses

Aside from their use as the sole resinous component of paint vehicles, glyceryl phthalate resins are outstanding for their use in conjunction with other synthetic resins and film-forming materials. In such combinations, the alkyds complement the other resin, yielding finishes superior to those obtained with either agent alone.

It will be recalled that the glyceryl phthalate resins first proved their worth and created something of a revolution in automobile finishes when they were combined with nitrocellulose. The resulting lacquers not only speeded auto finishing schedules, but also provided better and more durable coatings. Combinations of alkyd resins with nitrocellulose make it possible to broaden the usefulness of lacquers and contribute appreciably to the progress of lacquer technology. Recent European studies have shown that drying alkyds considerably improve the properties of nitrocellulose lacquers by increasing hardness and tear resistance without undue sacrifice in elasticity. Water resistance and durability are also improved by the addition of drying alkyds.

Similarly, alkyds are used to improve the flexibility, adhesion, toughness and other properties of urea-formaldehyde resins and melamine-formaldehyde resins. Color, mar resistance, hardness and baking cycles are also among the characteristics improved by such combinations. Paint technologists generally agree that no other film-forming materials so adequately complement the qualities of amino resins as do the alkyds. In this connection, Parker (4) recently observed that had the amino resins been exploited *before* the alkyds were pretty well-known, their good properties might either have been overlooked or their rapid development very sharply retarded.

Alkyd resins have also demonstrated their ability to complement the properties of silicone resins. Indicative of the role played by glycerine-utilizing products is the series of patents granted early this year to Goodwin and Hunter (5) for methods of reacting organosilanes or polysiloxanes with glycerine-dicarboxylic acid esters.

In large glycerine refinery plant of Reichhold Chemicals worker checks clarity of chemical.

Combinations of silicones with alkyds have led to new types of finishes with superior stability to high temperatures. In addition to this characteristic, coating films formulated with silicone-alkyds have superior hardness, abrasion resistance, adhesion and flexibility, plus a high degree of resistance to solvents, acids and alkalis. Tests have shown that such combinations also have high resistance to weathering. One new silicone-alkyd blend for use in concrete waterproofing is applied like a straight alkyd and air dried. The blend is said to give better water-resistance than either material used alone. Data have also confirmed the moisture barrier possibilities of silicone-alkyd formulations on stucco surfaces.

Other new synthetic coating materials that are attracting much attention are the styrenated alkyds. Such resins can be prepared by first styrenating the fatty acids, followed by esterification with phthalic anhydride and glycerine. In studies on the film properties of finishes prepared by reacting styrenated dehydrated castor oil fatty acid with phthalic anhydride and glycerine, it was found that these resins have excellent air-drying and baking characteristics. It was also observed that the styrenated alkyds are faster drying than conventional short oil alkyds or amino-alkyd resin mixtures. In addition, they were found to exhibit good overall film properties.

Introduced only a few years ago, the styrenated alkyds are already finding a place in low cost, fast drying enamels, in baking undercoats, and in air-drying undercoats. Indicative of their importance is the fact that some of the new Armed Forces paint specifications are based on the use of fast-drying styrenated alkyd resins. Styrenated alkyd finishes are used principally on machinery and equipment in locations where only fair chemical resistance is needed.

In conclusion, a recent development should be mentioned which may well increase even further glycerine's value as an alkyd raw material. Diglycerine, a polyhydric alcohol, results from the thermal condensation of glycerine

(Turn to page 61)

PART IX

RESEARCH AND DEVELOPMENT TECHNICS IN RAW MATERIALS FOR COATINGS

By
HOWARD C. WOODRUFF
Alkyd Products Engineering
General Electric Co.

PICTURE changes in two companies going on simultaneously. A raw material supplier becomes aware that he can alter his existing process or extend his present production set-up so that he can produce a new material. At the same time a paint manufacturer gets to know about the new material. He forsees that it will lower his costs and improve his product. When both companies activate work on the same new material — one aiming to make it, another aiming to use it, — you have a situation where new Material Development gets to work.

In a situation of this type, research and development have many jobs to do before a new product moves to market in commercial quantities.

When New Products are under way, Research and Development functions go far beyond the laboratory —

To get new products moving, Development puts the light on an industrial situation, but spotlights an opportunity and puts together a new product to fill it.

Mr. Woodruff discusses how this is done in the 9th article in our series.

Factors to be Considered

THE first thing that has to be done is the work necessary to answer a series of questions which are naturally brought up by both supplier and user. The user needs some prospectus of how a new material will do one or more of the following; (1) lower costs, (2) affect the labor involved, (3) increase market and (4) how it will perform technically. The user must consider the supply situation in the short, as well as the long-term trend and he must have information on the probable long-term price trend. He naturally takes into account whether the supply is a potential monopoly situation due to special facilities, patents, location of production, or source of raw material.

The producer needs answers to these questions, but he also needs to know the probable importance of the raw material in the customer's business, whether there are many similar customers available, what approaches are necessary to get them and if there are other

Editor's Note: This discussion is based on the varied personal experiences of the author. The facts and examples cited do not necessarily represent the practices of any single company.

markets where the product can be sold. The producer needs to know how definite his own raw materials are, what his costs of development, costs of manufacture and costs of sales will be, and what his anticipated profits will look like. It is also necessary to gauge the effect of action by competitors that would replace the product and to get an idea of the possible impact of other materials that would do the same job coming into the market.

In getting answers to these questions and in finding out what answers cannot easily be reached, the research and development team starts to center attention on the factors that need to be worked on. Answering the above types of questions about a series of possible products, naturally the series becomes classified into those items that can potentially yield profitable results and those for which a favorable outcome does not appear possible.

In the paint industry, new paint developments within the established systems are carried out by the paint manufacturers. This development work consists of quality improvement, cost saving, manufacturing simplification and more specific adaption of product to customer requirements. But fundamental scientific work, and work leading to new systems of coating materials, and the initiative to meet a coating requirement which is not even approximately met by present day coating systems, remains in the province of the raw material suppliers. This situation can be explained by the fact that paint manufacturers compete for business while raw material suppliers compete for quality of product. The chief competitive tool of the raw material supplier is product superiority.

Where is the Product Used?

The effective development of new products for the coatings materials industry starts from an understanding of the actual market. In order to plant the development seed in fertile ground, the raw material man has to know; (a) the technical weaknesses in a given market, (b) products necessary to overcome the weaknesses, and (c) he has to have the possibility of making those products. The raw material manufacturer has to key into this picture in accordance with where his strength actually comes from. His strength may originate from raw material availability or from technological superiority or from specialized equipment or from effective distribution or from special market contacts. The raw material supplier has a chance for a new product development when he finds a spot where the industry technology is insecure and where he can bring proper tools and products to bear on it. This is the three-way job between markets supplier and technology that research and development has to work on.

The Tentative Product

Having established that a tentative new product will be an advantageous venture to both producer and consumer, the development groups set up some idea of a "tentative product" description. The tentative product description serves as a basis for discussion and planning. It is gradually shaped and fitted so that both customer's requirements and manufacturer's conditions can be met. The tentative product description is an instrument of coordination within a producer's organization being in a formable state and adaptable to the manufacturing setup, the material supply and distribution organization.

The "tentative stage" of a product actually exists in development groups, large or small. It may not even be reduced to a written form, or its existence may not be formally recognized. But when it is consciously used as a "development tool" and a tool of coordination, the "lead time" between original idea and commercial production is considerably shortened. The idea of a formable and adaptable stage is a necessary step in the realistic approach to new material development. The new material must be selected or adapted to fit into the normal expansion of both producers and customers expansion of business, and both have to be prepared to handle it adequately from the viewpoints on manufacturing facility product line.

Other Market Outlets

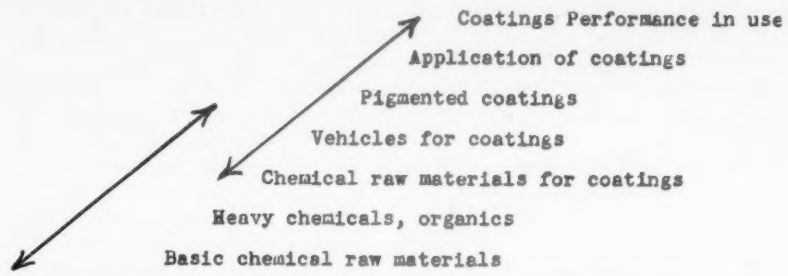
The products of a supplier to the paint industry can move to a more diversified field than the products of the consuming industry itself. This means that a new product is not necessarily limited to the market within the paint industry where the original need accounted for its origin. Few suppliers to the coating materials industry supply to the one industry alone. In some instances, the coating materials industry represents only a minor proportion of the supplier's actual market. For example, the solvent requirements of the coating materials industry represent only a small fraction of the markets actually supplied by the solvent producers, but an odorless solvent, while very much desired by the paint industry would also be very desirable when used in dry cleaning, in textile scrubbing and in various cleansers. A "special" pigment development for pigmented coatings, phthalocyanine blue, is now used extensively in high speed printing inks and textile printing media. Sebacic and azeleic acids, developed as raw materials for plasticizers used in coatings have made new lubricating oil additives possible. The more basic the manufacturer's starting materials, the more diversified is his market potentiality.

Handling a New Product

THERE is no uniformity in sales organization or sales methods from one company to another. It does not appear that any two sales setups place equal emphasis on a given product feature or would evaluate any series of products on an equivalent basis.

This means that when a sales department looks at a new product possibility, it will view it from its own particular frame work of organization and experience. A development man accordingly is usually under the obligation to shape its products in accordance and within a set sales framework. From the development point of view, sales action on new products may take some of the characteristics of one of the following forms:

(1) Simple widespread distribution of samples. In this case the customer carries out all the testing and evaluation, respondingwith a "yes" or "no". New product development in preparing for a sales approach of this style does not have to do much more



Comparison of the Research and Development Span
Raw Material Phase (RM)-left arrow vs. Coating Materials Phase (CM)-right arrow

than produce a product. The product line, while aggregate volume may be high, sales of any individual items are apt to be small. This type of sales line consists of many similar items. Technical support to series and excessive ultimate costs results. The new product break-in time is longest in this type of selling.

(2) Distribution of samples to prospective customers accompanied by well organized suggestions for using the product. This type of selling usually requires the product man to have enough information about the intended use of the product to test it intelligently, evaluate its favorable and unfavorable points, and present methods of using it which will minimize or overcome any desirable characteristics.

In this type of selling, the break-in times are short, sales relatively assured and ultimate sales expenses relatively low, but, only those markets can be reached that are originally set as goals.

(3) Cooperation with one or a few customers in a test area followed by product modification where found desirable. This technique reaches a market with a minimum of lost effort. The products supplied tend to be highly specific to a few customer's requirements, but due to close knowledge of the customer's operation, increasing outlets for developments open up. This technique becomes the lowest in ultimate selling cost. The development man maintains his new product in the fluid state until his customer has it incorporated into his production.

(4) Informing the customer that a submitted sample is one of a series of products that can be derived from a basic set of raw materials, that others in the series are available and will be made on the customer's request. In this case the development group uses one product as the start of a future program. The direction that such a program will lead is uncertain. This program relies on the idea that a use will be found somewhere if enough branches and pathways are followed.

(5) Specific identification of the new product by a trade name and advertising the new name so that the customer's customers will request that the product be used to make the materials they purchase. This strategy only slightly involves the direct action from a research and development group.

The above sales channels relate to new products. Sales of products made where the only objective is to "match" a product previously in use may be initiated through an entirely different variety of sales channels.

Customer Views

CUSTOMER'S action on new product passes through the stage of consideration, evaluation and testing, trial use, and full scale production. At all these stages the development group has the prime responsibility to follow through and supply the incentive required to bring to commerical use and to supply supplementary information on the technical aspects of the problems when and where such information is required.

The coating materials manufacturer must set up a means of presorting the many varieties of potential new materials that come to their attention. The paint manufacturer who depends excessively on suppliers tends to become a test agent for the supplier. The sorting process goes on when a potential new material is examined in the light of its probable commercial status.

Commercial Status of a New Material

BEFORE the management of a manufacturer authorizes the evaluation and testing of a new raw material, or before serious consideration is given to test data that is at hand, certain basic information on the commercial status material itself must be supplied. This is organized by the raw material manufacturers development group and it is (or should be) checked by the corresponding group in the consumers organization.

A material forming the basis of a prime item or items in a manufacturers line must be available in assured supply at an economic level and be produced by a group who have enough production facilities to more than produce the requirements of any single consumer — otherwise supply is not assured. Assurances of a favorable supply and production facility are even more important when the supplier is the sole producer of the material in question.

Many management groups today place a high value not only on how a new raw material performs, but on the accuracy and detail of specification and test data submitted with it. They also consider the ability of the supplier to

(*Turn to page 55*)

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The sleek, streamlined appearance of Continental steel containers tells you that they were designed by men with a packaging expert's eye for good looks, as well as an engineer's interest in utility.

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Here many raw materials gathered from practically every corner of the world are checked and tested by skilled laboratory technicians before they are accepted for plant processing.

This instrument is used to measure abrasion resistance. The wear in a paint film can be measured by thousandths of an inch. In this way abrasion resistance of a paint can be compared.

This is the control section of lab. Here samples of every batch of paint in production in the plant are subjected to a number of tests to make sure they measure up to high standards.

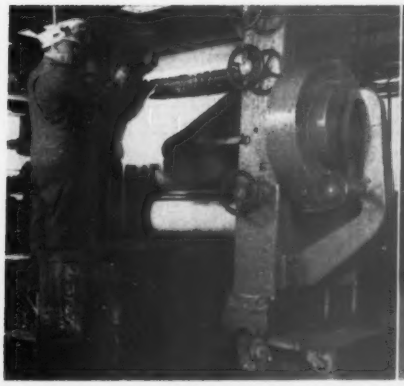
A Look into the McDougall-Butler Plant

BACK in the days when Grover Cleveland occupied the White House, this company was born. Under the leadership of Spencer-Kellogg and Sidney McDougall, its purpose was to make fine paints. As time went one, facilities were added to varnish making, and later the manufacture of pure white lead.

Through the years of growth, the company was subsequently known as the Buffalo Oil, Paint and Varnish Company, later as Kellogg-McDougall and in 1919 it acquired its present name, McDougall-Butler Company, Inc.

Accent on quality has always been the keynote of the McDougall-Butler Company and the "Buffalo" trade mark on paint products is recognized as a mark of excellence in formulation and manufacture.

McDougall-Butler manufactures a line of paints for master painters, homes and institutions. Maintenance paints are a specialty with McDougall-Butler. These include a line of industrial maintenance paints, farm maintenance finishes, building maintenance finishes, chemical-resistant coatings, bus and truck finishes and railroad finishes especially for steam and diesel locomotives.



This high speed multiple roller mill grinds the concentrated paste to enamel fineness. These roller mills typify the most modern method of paint grinding — superior than older methods.

Huge pebble mills are designed to produce extra fine grind of enamels and undercoats, especially whites. Rotation causes million of impacts which grind paint to superior fineness.

Dry pigments and oils are fed into mixing machines. Powerful agitator arms of these mixing machines work the pigment and oils into heavy, uniform paste, ready for fine grinding.

The finely ground heavy paint is now thinned and tinted. Blended oils, varnishes and driers are added by weight for accuracy. Tinting is done by adding finely ground colors.

Vehicle is stored in separate tanks with its own pump and pipe line across to manufacturing plant. By push button controls exact amount of vehicle can be delivered to the point of use.

Thinning department shows a paint maker drawing off linseed oil. Piping system was developed by McDougall-Butler engineers to make it possible to quickly, safely transfer oil.

This 1,000 gallon pressurized cooking unit of latest design provides rigid control in processing oils, resins, and varnishes. Made of stainless, it features all latest control equipment.

Varnish open kettle cooking equipment is made of stainless steel, is oil fired with blower burners and radiant heat. No direct flame can scorch material in process. For small batches.

Finished batches await final test and approval by lab. Tanks are constantly being emptied and refilled because process is continuous. Paint will then be sent to filling machines.

Shown here is one of the automatic pressure-type filling machines. These machines not only fill the cans to accurate measure but also cap them. Above are qt. cans being filled.

Operator feeding unlabeled cans into automatic labeling machine. With approximately 150 different varieties and nearly 300 colors, shades and hues, this operation is important.

Lengthwise view of stock room and classification counters. Here McDougall-Butler stocks reserves of all their most popular products — always ready for shipment on moment's notice.

Dr. R. L. McCLeary

Dr. McCleary Speaks on Calcium Extenders at N.Y. Meeting

The New York Paint and Varnish Production Club held its first meeting of the Fall Season on Thursday, September 4th in New York City. Two hundred and fifty-nine members and guests attended to hear Dr. Ray L. McCleary speak on "Calcium Carbonate Extender Pigments in Exterior House Paints."

President Herbert Hillman introduced the honored guests, Dr. McCleary, H. T. Barnette, Sales manager of Thompson-Weinman, Paul E. Kummer, Assistant to Dr. McCleary and Si Mountsier Jr. of Whittaker, Clark & Daniels,. Robert Wrenn of the Philadelphia Club was a welcome visitor.

Ernest S. Paterno, Chairman of the Membership Committee, announced the acceptance of the following new members; Class A — Harold F. Flegenheimer, G. Donald Lieb and Tyrus W. Peck, all from Devoe and Raynolds Company. Class A Transfers; Samuel J. Melnick to Industrial Marine Products and Melvin Sterling to Aula Chemicals, Inc. John Murphy was elected an honorary member.

According to Carl Engelhardt, Chairman of the Technical Committee, the New York Club will have two papers for presentation at the Chicago Convention. One, by Edward J. Dunn Jr. on Method of Measuring the Dry Hiding Power of Paints, part two and the other by E. K. Zimmerman on a Study of Pigment Dispersion, Part four.

The availability of many excellent paint varnish and lacquer courses available in schools and colleges in the New York area was announced by Fred Damitz, Chairman of the Educational Committee. Fred also called attention to the fact that Federal Specification TT-P-141 is up for revision and advised anyone with suggestions for corrections should write to the Joint Educational Committee and express their views.

President Herbert Hillman concluded the business session and turned the meeting over to the Chairman of the Program Committee, E. Dale Albert. The introduction of the speaker was actually made by Si Mountsier a long time associate of Dr. McCleary.

Dr. McCleary, after receiving his degree from Ohio State University spent eleven years as a chemist in the pigments department of E. I. DuPont & Co. For the past eight years he has been the Technical Director of the Thompson - Weinman Research Laboratory.

In recent years according to Dr. McCleary there has been a great challenge for research in the field of exterior house paints by a producer of extender pigments because of the large volume potential, the high cost of lead and zinc pigments, the limitations of the commonly used magnesium silicate pigments and the many variations possible with the available titanium pigments. In addition, a producer of extender pigments can not only study products already in production but also, new grades, or even entirely new products.

Dr. McCleary divided his talk "Calcium Carbonate Extender Pigments in Exterior House Paints" into three parts. Part one was a systematic evaluation of various grades of ground Calcium Pigments in both whites and tints of low and high P.V.C. types of house paints. Part two covered the more radical formulations containing Calcium Carbonate or Calcium Carbonate in combination with a high brightness mica. Variations included replacing a part or all of the linseed oil with other oils. The lead-zinc oxide content was reduced stepwise to zero and in lead free paints the zinc oxide was reduced in a similar manner to zero. Part three was termed the "Forward Look" with emphasis on formulating exterior paints — whites, tints and dark shades which have the best combination of package, application and durability characteristics per dollar of cost.

The experimental data, formulations and exposure panels were presented on slides for comparison.

Dr. McCleary summarized the results of the three groups and then presented some conclusions that he felt were justified from the work that has been done to date. These are as follows:

1. Ground calcium carbonate pigments having very low absorption can be quite successfully used in the manufacture of high quality exterior house paints.

2. Ground calcium carbonate pigments which contain substantially no particles above the 25 micron range and yet display very low absorption, give the best overall results in exterior house paints.

3. The use of low absorption ground calcium carbonate as the major or sole extender pigment, renders it unnecessary to use the customary quantities of Pb-ZnO or Acicular. ZnO in order to have satisfactory mildew resistance.

4. The use of low absorption calcium carbonate in combination with a minor amount of high brightness mica, not only eliminates the need for the customary amounts of Pb-ZnO or Acicular. ZnO to prevent mildew growth, but practically insures against a cracking type of failure.

5. Many other favorable conclusions about the use of ground calcium carbonates in exterior paints could be predicted, but more exposure time is needed to convert such predictions into facts. Thus, they of necessity, must be held until a later date.

•

Editorial Director To Be Made Honorary Member Of A. I. Of C.

Sidney D. Kirkpatrick, vice-president and director of editorial development of McGraw-Hall Book Co., Inc., will be made an honorary member of the American Institute of Chemists at the October 9, 1952 meeting of the New York Chapter of the Institute, according to Karl M. Herstein, president of Herstein Laboratories, Inc. and chairman of the New York Chapter.

The event will take place at the Hans Jaeger restaurant, Lexington Avenue and 85th Street.

Mr. Kirkpatrick, who is also editorial director of Chemical Engineering and Chemical Week, will receive the presentation from Dr. Lincoln T. Work, president of the American Institute of Chemists.

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American Can Establishes New Packing And Handling Division

The American Can Company has established a new Packing and Materials Handling division to consolidate the handling, packing and shipping functions of the general manufacture department, according to G. W. Reese, general manager of manufacture.

S. S. Nicholson, who has been with American Can for 25 years, was appointed supervisor of the new division. He is well known in the materials handling field and is a member of the National Security Industries Association.

To *prevent* mildew, fortify paint with Du Pont IN-2555

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Du Pont IN-2555 (Phenyl Mercury Oleate) is an organic mercurial unsurpassed for fortifying paint against mildew occurrence. It is water-insoluble, nonvolatile at ordinary temperatures and stable to ultraviolet radiation. Additionally, it produces an amorphous film that will not creep or bloom on the surface. IN-2555 is effective in low concentrations and can usually be added to production mixes without formulation changes.

Many paint manufacturers are already profiting with Du Pont IN-2555. Its unique characteristics and wide adaptability can help you to improve your products, too. For detailed technical data, fill out and return the coupon today.

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E. P. Carney

Metal Disintegrating Company's Head Chemist Honored At Dinner

Elvin P. Carney, chief control chemist of Metals Disintegrating Company, Inc., was guest of honor at a recent company dinner celebrating his 25 years with the firm, according to a company report.

More than 50 of Mr. Carney's associates and company executives attended the affair held on Wednesday evening, September 10th. Highlight of the evening event was the presentation by Mr. H. E. Hall, president of the company, of a gold watch, suitably inscribed, to Mr. Carney.

•

Bright Outlook Forcast For Paint Industry

A lot of paint is going to be sold within the next few months, according to a survey released by the American Home magazine recently.

The bright outlook forcast for the paint industry was based on a check of 2,000 home-owning Americans representing an accurate cross-section of the nation, the magazine siad.

Here's what the survey revealed: 70 percent of American homeowners plan to repaint some part of their homes in the near future, almost 40 percent plan to paint both interior and exterior, about 44 percent plan to paint only their interior, and 17½ percent plan to repaint the exterior.

Projected on a national scale the report shows that at least 30 million dwelling units are due to be repainted in the near future.

Government Specialists To Discuss Military Packaging

A group of top level government packaging experts will take part, along with industrial packaging engineers, in a panel discussion of "The Latest Developments in Military Packaging" on Thursday afternoon, October 16, in Chicago in conjunction with the 7th Annual Protective Packaging and Materials Handling Exposition, according to H. H. Loeffler, president of the Exeter Paper Co., Chicago, chairman of the session.

The panel discussion will be the closing feature of the four-day technical course to be held between October 13 to October 16 in conjunction with the Exposition, Mr. Loeffler said.

Members of the government team are: Raymond A. Norris, Chief, Packaging Division, Munitions Board Standards Agency, Washington; L. C. Heller, Packaging Section, Office of Naval Material, Navy Department, Washington; W. H. E. Rodenbaugh, Jr., Navy Department, Washington; Lt. Col. Robert W. Johnson, Chief, Packaging Division, Air Material Command, Wright-Patterson Air Force Base, Dayton Ohio; William D. Long, Packaging Division, Air Materiel Command, Wright-Patterson Air Force Base; E. F. DeAtley, Chairman, Army Packaging Board, Office of the Assistant Chief of Staff, G-4 Logistics, Department of the Army, and G. B. Wareham, Panel Director, Committee on Equipment and Supplies, Research and Development Board, Washington.

The names of the industrial packaging engineers who will participate in the panel discussion will be announced later

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Cabot Producing Georgia Clay Through Purchase Of Pigment Firm

Godfrey L. Cabot, Inc., Boston, Mass., announced recently it had begun production of air-floated and water-washed Georgia clay.

Through the acquisition of the Georgia Pigment Company, Sandersville, Georgia, the Cabot Companies are now able to offer several quality grades of Georgia Kaolin in commerical quantities for use in the paper and ceramic industries, the announcement said.

Plans are underway to expand the facilities of the Georgia plant, including the establishment of a new technical control laboratory, to produce a complete range of Georgia clays for use in rubber and other industries, the announcement added.

The Georgia Pigment Company will retain its name in the new Cabot operation, and William W. Kingman and J. T. Houk will retain their positions of general manager and sales representative, respectfully.

V. H. Vedda

Brandram-Henderson of Canada Names V. Vedda Technical Dir.

V. H. Vedda has recently been appointed technical director in charge of production of Brandram-Henderson, Ltd., Montreal, Canada. This firm, one of the largest Canadian paint producing plants, manufactures a line of paints, varnishes, enamels, dry colors and white lead.

Mr. Vedda was formerly plant superintendent of the A. C. Horn Co. of Long Island City, N. Y. His first position with A. C. Horn was in 1947 when he was named head of the Raw Material Control section. Later he was promoted to supervisor of all mixing and grinding operations.

Prior to his connection with A. C. Horn, Mr. Vedda was associate head of the Insulation Dept. of Centro Research Laboratories. His first position in the paint industry was with the Insul-X Co. where he worked as a resin chemist. Mr. Vedda received his education at Columbia University and graduated in 1942 with a B. S. degree.

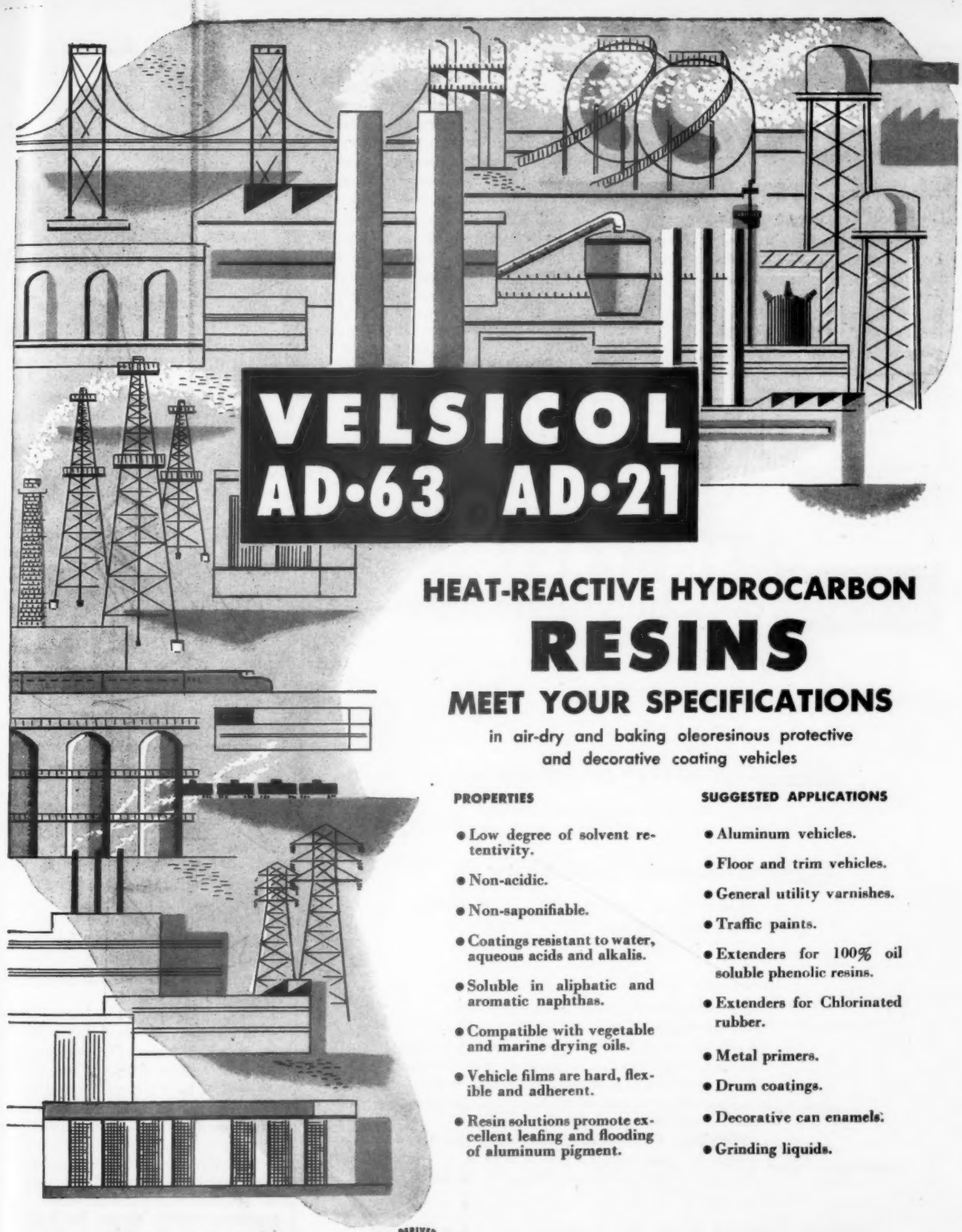
•

Paint Industry Chairmen Named For Drive In Behalf Of JDA

A. C. Horn, of A. C. Horn Co., has been named honorary chairman, and Robert I. Wishnick, of Witco Chemical Co., appointed co-chairmanship of the Paint & Chemicals Industry's drive in behalf of the Joint Defense Appeal, according to a recent announcement by Milford H. Corbin, of Standard-Toch Chemicals, Inc., chairman of the JDA division.

ERRATA

In our August issue we published a highly informative and practical article entitled "Manufacturing Latex Paints." Through a regrettable error on our part this was not credited to Edward Sholl, consultant on latex paints to the Ansbacher-Siegle Corp. We offer our apologies for this oversight.



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- Drum coatings.
- Decorative can enamels.
- Grinding liquids.

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REPRESENTATIVES IN PRINCIPAL CITIES

Technical Comm. Reports of N.Y. Club Will Feature Oct. Meeting

The New York Paint and Varnish Production Clubwill hold its next regular meeting October 2nd 1952 at #2 Park Avenue, New York City. Dinner will be served on the 26th floor in the dining rooms of the Building Trades Employers Association at 6:30 PM.

The program for the evening will be the sixth consecutive yearly report of the activities of the Technical Committee. The Subcommittees will present a summary of its accomplishments during the year, and Subcommittees #40 and #53 will present previews of the two papers to be given at the Federation Convention in Chicago in November.

The following are the Committees that will give resumes of their work:

Subcommittee #37 – Stanley H. Richardson, Chairman, Investigation of Methods for Measuring Drying Time.

Subcommittee #40 – Edward J. Dunn, Jr., Chairman, Methods of Measuring the Dry Hiding Power of Paints.

Subcommittee #44 – James A. Massaro, Chairman, Emulsion Paints.

Subcommittee #53 – Erik K. Zimmerman, Chairman, Study of Pigment Dispersions.

Subcommittee #54 – Marcus Thau, Chairman, A study of the Dielectric Strength of Paint, Varnish and Lacquer Films.

Subcommittee #58 – Frederick M. Damitz, Chairman, Standards & Methods of Test.

Subcommittee #62 – John J. Hendricks, Chairman, Investigation of Flat Wall Paints.

Subcommittee #65 – Oscar P. Muller, Chairman, Test Method for Evaluating The Dispersing Properties of Vehicles.

•

Paint & Varnish Production Clubs Federation Cites Its Trigg Award

One of the most unusual awards offered by any technical groups is the Federation of Paint and Varnish Production Clubs Ernest T. Trigg Award presented annually to the Constituent Club Secretary who records the most complete and interesting minutes of meetings with promptness, according to a Federation bulletin.

The $25 award, established by Mr. Ernest T. Trigg several years ago, is presented at the annual meeting of the Federation.

The judging committee makes its decision after examining minutes that are forwarded to the Federation headquarters for publication in the Official Digest.

Mr. J. W. Garrett, of the Houston Club, was the 1951 winner of the Trigg Award.

The Trigg Award Committee for 1952 is headed by Mr. W. Victor Jones of the Houston Club, and includes, Mr. J. J. Hughes, Jr. (Southern), Mr. J. W. Nee (Houston), Mr. H. C. Owens (Houston), and Mr. A. J. Ziegler (Dallas).

Mr. Trigg, retired president of the National Paint, Varnish and Lacquer Association and now honorary chairman of the Association's Executive Committee for life, has long been a supporter of Federation activities.

NEW!

EASTMAN INDUSTRIAL CHEMICALS **di-isobutyl phthalate—**

of particular importance to users of dibutyl phthalate

EASTMAN **di-isobutyl phthalate—**

more economical than dibutyl phthalate

EASTMAN **di-isobutyl phthalate—**

provides better low-temperature characteristics than dibutyl phthalate

Our own evaluation of di-isobutyl phthalate indicates that its replacement of dibutyl phthalate in cellulose nitrate formulations is accompanied by an increase in desirable low-temperature characteristics. Other properties of such formulations appear to be identical. More economical than dibutyl phthalate, Eastman di-isobutyl phthalate warrants your investigation. For further information and samples contact our local representative or write to Tennessee Eastman Company, Kingsport, Tennessee.

SALES REPRESENTATIVES: New York—260 Madison Ave.; Framingham, Mass.—7 Hollis St.; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast:** Wilson Meyer Co., San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

TENNESSEE EASTMAN COMPANY Division of Eastman Kodak Company KINGSPORT, TENNESSEE

Tung Industry Advised To Improve Efficiency And Not To Expand

Tung fruit processors can improve their profit position by more efficient production methods and limiting mill expansion for several years, according to a report on tung processing methods, by the United States Department of Agriculture.

Tung oil, derived from the fruit, is used in marine paints, high-quality electric insulation and other specialized products.

An industry study by the Production and Marketing Administration revealed that most of the mills have excess production capacity for the tung fruit available. However, since the number of tung orchards planted has increased greatly since 1940, the added yield should improve plant utilization providing no new mills are built, the report said.

A two year study between 1947 and 1949 of the 14 mills comprising the industry revealed that the average processing cost per ton of tung fruit was $17.13, and that there was a difference of $17.93 between the highest and lowest cost operation.

For the year 1948-49 the average mill cost corresponded closely to mill returns from processing for a fee. The figures were $12.69 per ton processing charge plus $7.19 per ton for value of meal and hulls which the processor retains, according to the study.

The figures were arrived at on the basis of the customary guarantee by the processor to return 86 percent of the oil content of the fruit.

Most of the mills have offset their low volume and short season operations by combining, wherever possible, tung processing with other business enterprises. The most common of such enterprises is the growing of tung fruit.

A processor has to know the costs of each segment of his business to obtain the most efficiency, the report said. It further advised that the industry needs to make an impartial study of the joint costs of tung processing, tung orcharding, and other integrated enterprises such as beef cattle.

A copy of the report, "Tung Processing and Marketing Practices and Costs," may be obtained from the Office of Information Services, Production and Marketing Administration, United States Department of Agriculture, Washington 25, D. C.

Production One Month Ahead Of Schedule At New Glyco Plant

The Glyco Products Co., Inc. began partial manufacturing operations at its new plant in Williamsport, Pa., about a month ahead of schedule, according to a recent company report.

Edible monoglycerides for use in baking, ice cream, candy, chewing gum, food, textile, plastic, rubber, paint, and other industrial products, will be among the first items to go into large scale production at the new plant, the report said.

The plant features new equipment designed by the H. K. Ferguson Co., for more efficient and economical production, along with enlarged storage and shipping facilities, the announcement said.

Situated on 30 acres of land, the plant has 150 thousand square feet of floor space, and is served by four railroad sidings. Three coal-and oil-fired high pressure boilers supply a power plant of 1400 horsepower.

Other plant facilities include a 500 Kilowatt geared turbine and generator, wells which furnish processed water at the rate of 500 gallons per minute, heavy duty tunnel dryers which occupy two floors of one building and a 41 ton ammonia refrigeration unit.

The company's present plants are to shift all civilian production to the new plant by Nov. 1, of this year, and to produce special chemicals for the defense program at the Natrium, W. Va. plant, the report stated.

YELKIN TTS
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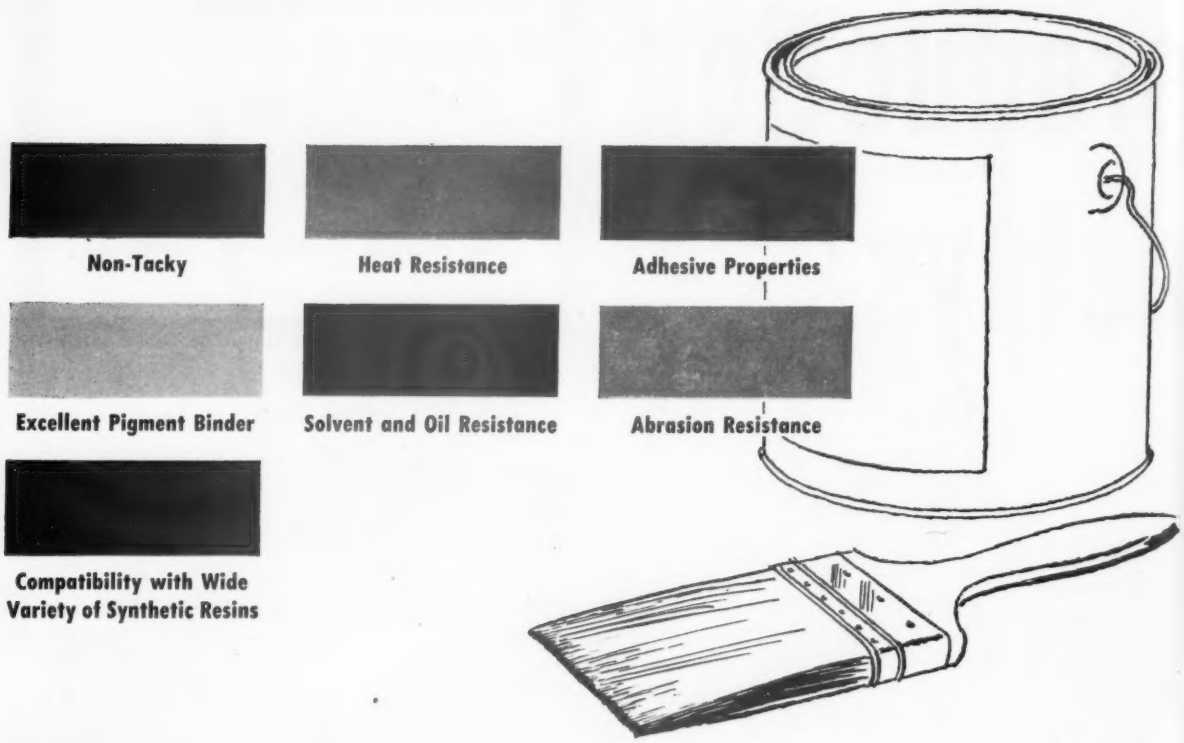
News about

B. F. Goodrich Chemical *raw materials*



Seven Ideas for paint formulations - with HYCAR latex!

USED as a pigment binder in many fields, Hycar latex has properties that may give you ideas for developing or improving paint formulations. For information about Hycar latices, write Dept. HS-10 B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario. Cable address: Goodchemco.

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GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new and improved products. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

DILLON

TESTING MACHINE
Multi-Low-Range

Tester is capable of applying a load to specimens with extremely slow speed and stopping the load instantly. Instrument is available with following grip clearances: 14¾", 24", 36" and 48". Basic dial is calibrated with four individual scales: 10 lb. range with ½ lb. divisions; 25 lb. range with 1 lb. divisions; 50 lb. range with 21 lb. divisions; 100 lb. range with 5 lb. divisions. A supplementary dial is available, calibrated for 0-300 lbs. with 1 lb. divisions. According to the manufacturer, accuracy of this tester is within ½ of 1% to meet ASTM requirements.

Elongation readings with this instrument are provided by means of a special elongation scale and traveling hair line affixed to the moving platen. Tests can be made in tensile, compression, transverse and shear. W. C. Dillon & Co., Inc., 1421 South Circle Ave., Forest Park, Ill.

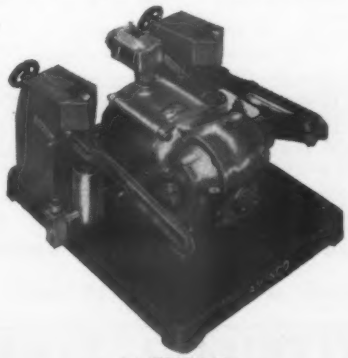
CARBON DISPERSIONS
For Latex Paints

"Aqua blacks" are stable colloidal aqueous dispersions containing carbon black varying in particle size from 18 millimicrons to 83 millimicrons. As stabilized dispersions, they are ready for use without additional milling and can be added to latex systems with simple agitation.

"Aquablack M" contains a furnace black with the characteristic blue tone of a lampblack. It may be used in latex paints as a general tinting medium, particularly for blue tone grays. According to the manufacturer, this dispersion may be added to either the latex-protein system or the modified latex system with equally good results.

"Aquablack M" may be added to the latex system in many different ways: (1) to the grinding base, (2) to the ground base, (3) to the latex before it is incorporated into the system, (4) to the finished paint.

Advantages in the use of this dispersion include: ease of handling; good uniformity of color, freedom from streaks or undispersed pigment; ease of tinting; stable dispersion; economy — high carbon loading; flooding and floating minimized. For further details write to Binney & Smith, 41 E. 42nd St., New York 17, N. Y.



AMERICAN

LEAD TITANATE
Continuously Available

Lead titanate is now available on a continuous basis. This particular pigment is of interest to paint formulators because of its following properties: good durability, non livering or thickening, retardant to chalking, cracking, flaking and good hiding characteristics. Technical data and samples are available upon request. Filo Color & Chemical Corp., 202 E. 44th St., New York, N. Y.

PROPORTIONING PUMP
Offers Several Features

Displacement of all liquid in the cylinder at every stroke, with stroke adjustable while the pump is running are features of this chemical proportioning pump.

Other features are: both the stroke adjustment mechanism and the legible indicating scale are stationary while the pump is running; the piston is reciprocated by a positive mechanical linkage to the crank arm (it does not rely on a return spring); check valves can be removed easily for cleaning or replacement; powered by Class I Group D explosionproof motors.

Piston and cylinder assemblies of stainless steel (or other alloys) for 7500, 15,000, and 30,000 psi working pressures, are readily interchangeable in the same pump frame, a noteworthy economical feature.

These pumps are available in simplex style, duplex style, (each side for the same maximum working pressure), and combination duplex style (each side for a different maximum working pressure), with various maximum displacements according to pressure.

Details are given in Bulletin 4061 which is obtainable from the manufacturer, the American Instrument Co., Inc., Silver Spring, Maryland.

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Alcohol, Industrial
Alcohol, Proprietary Solvent
Aluminum Paste
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Anti-Flooding Agent
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Blown Oils
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Detergents
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Dibutyl Phthalate
Diethyl Phthalate
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Driers—Naphthenate, Octoate & Linoresinate
Dry Bleached Shellac

Emulsifiers
Enamel Vehicles
Ester Gums
Ester Gum Solution
Ethyl Acetate
Ethyl Lactate
Ethylene Dichloride
Fatty Acids
Fatty Acid Distilled
Fish Oil & Specialties
Gilsonite and Solutions
Gloss Oil
Glycerine, Crude
Glycerine, High Gravity

Heptane
Hexane
Hi Flash Naphtha

Isobutyl Alcohol
Isophorone
Isopropyl Acetate
Isopropyl Alcohol

Kidney Oil

Lacquer Thinners
Lactol Spirits
Lime, Chemically Hydrated
Linseed Oil
Linseed Oil Fatty Acids
Litharge

Methanol
Methyl Acetate
Methyl Acetone
Methyl Amyl Acetate
Methyl Amyl Alcohol
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Mildew Preventitives
Montan Wax

Naphthalene
Naval Stores
Nitric Acid

Oiticica Oil
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Paint Oils
Paint Thinners
Paint & Varnish Driers
Paint & Varnish Removers
Peanut Oil
Perchlorethylene
Petroleum Ether
Phenothiazine
Pine Oil
Pine Tar
Pine Tar Oil
Pinene
Pitch and Pitch Solutions
Plasticizers
Plasticizing Oils
Printing Ink Driers
Proprietary Solvent
Puffing Agent

Rapeseed Oil
Rapeseed Oil, Blown and Refined
Red Lead
Red Oil
Resin Alcohol Soluble
Resin Dispersions and Emulsions
Resin Plasticizers
Resin Solutions
Resin Solvents
Resins, Alkyd (Solid and Solution)
Resins, Coumarone — Indene & Solution
Resins, Maleic
Resins Pentaerythritol
Resins Phenolic
Rosin
Rosin Derivatives
Rosin, Dry Soap
Rosin Hydrogenated
Rosin Limed
Rosin Oils
Rosin Polymerized
Rosin Residues
Rubber Compounding Materials
Rubber Reclaiming Agents

Safflower Oil
Shingle Stain Oil
Soda Ash
Soda Caustic
Solvent Naphtha
Solvent Naphtha — High Flash
Solvents, Terpene
Soybean Fatty Acids
Soybean Foots
Soybean Oil
Stabilizers
Stearates — All Types
Stearic Acid
Sulfonated Oils

Tackifiers
Tall Oil, Crude
Tall Oil, Refined
Terpene Hydrocarbons
Textile Chemicals
Toluol
Trichlorethylene
Tricresyl Phosphate
Tung Oil
Turpentine, Gum and Wood
Turpentine, Sulfate

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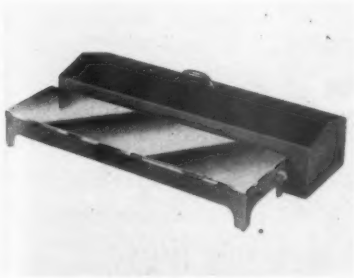
NEW PRODUCTS

BRIGHTON

500-GALLON KETTLE

For Mixing Rubber-Base Paints

Battery of 500-gallon, steel steam-jacketed kettles have been used in solving a stubborn rubber-paint mixing problem. These kettles, equipped with special double-motion agitators are designed to give the substance they mix smoothness and consistency. The two-way agitation provides more thorough mixing; kettle walls are kept clean during the mixing operation; and the required heat transfer through the kettle walls is constantly maintained. The result of this double-motion agitation was the smoothness and consistency desired in the full rubber-paint product. For full information write to Brighton Copper Works, Inc., 820 State Ave., Cincinnati 4, Ohio.



LABLINE

WARMER PLATE

Thermostatically Controlled

Warmer plate is used for keeping solutions at desired temperatures, for evaporations below boiling point, or as a utility heating plate for any surface temperatures from room to 100 deg. C. Features large working surface, sensitivity ± 1 deg. C., built-in thermometer and temperature control knob. Labline, Inc., 217-221 Desplaines St., Chicago 6, Ill.

If your job involves color formulation and the selection of pigments, you'll welcome the useful information contained in these handy technical reports. They've been prepared by Williams to make it easier for you to quickly select a pigment having chemical and physical properties which hit your color specifications "on the head". Each report describes the origin of the pigment, how it is made, its chemical and physical properties, and its applications. The reports cover Pure Red Iron Oxides, Pure Yellow Iron Oxides, Chromium Oxides, Venetian Reds, Siennas and Umbers, Metallic Browns and others. Write today for your complete set. Address Department 23, C. K. Williams & Co., Easton, Pennsylvania.

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The Donald McKay Smith Company
DALLAS, TEXAS
W. W. Richerson Co.
DETROIT, MICHIGAN
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California Flaxseed Products Company
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Deeks and Miller Company
MINNEAPOLIS, MINNESOTA
Horton-Earl Company
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W. Ronald Benson, Inc.
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NEW PRODUCTS

PHENOLIC RESIN
For Modifying Alkyds

Durez 240 Resin is a terpene phenolic, oil-soluble, very high melting, high viscosity, and thermoplastic. It is used in modifying alkyds by entering into the esterification reaction and becoming an integral part of the alkyd polymer.

Because of the molecular structure of the product, some molecules will enter into the polymer chain as a dibasic acid while other molecules acting as a monobasic acid will be chain terminators. Preferred method for incorporation of this phenolic resin involves the replacement of a certain percentage of phthalate ester with an equal percentage of Durez 240 ester. In short to medium oil alkyds up to 25 to 30 percent replacement can be effected without requiring other changes in formulation.

For greater replacements of the phthalate ester in short to medium length or for substantial replacements in longer oil modifications, it is necessary to replace a portion of the usual drying oil with a conjugated oil such as Chinawood to obtain a suitable viscosity. The same end result may be approached by replacing a portion of glycerol with an alcohol of greater functionality. Durez Plastics & Chemicals, Inc., North Tonawanda, N.Y.

FATTY ACIDS
For Alkyd Resins

Of particular interest to alkyd resins manufacturers is the improved quality of Emery 600 Distilled Cottonseed Type Fatty Acid and Emery 610 Distilled Soya Type Fatty Acid with respect to lighter colors and better overall uniformity.

Also of considerable interest are two new tailor-made soya type fatty acids, Emery 614 Distilled Soya Type-Alkyd Grade, and Emery 618 Distilled Soya Type-Super Alkyd Grade, both of which offer color and iodine value advantages.

These fatty acids, plus Emery 622 Double Distilled Coconut Type, Emery 630 Distilled Corn Type, and Emersol 9305, 9310, 9315 Double Distilled Liquid Vegetable Type Fatty Acids, offer a complete selection of fatty acids for alkyd resins.

For other uses, the above fatty acids plus Emery 640 Distilled Palm Type and Emery 621 Distilled Coconut Type Fatty Acids, provide a wide selection of highest-quality vegetable type fatty acids.

For complete specifications and compositions of these Emery Vegetable Type Fatty Acids, write to: Emery Industries, Inc., Dept. 5 — Carew Tower, Cincinnati 2, Ohio.

STYRENATED EPON
Fast Drying

Styrenated Epon Ester L-6-N-3 is said to combine very fast dry and exceptional hardness and flexibility, and mar resistance in coating formulations. Outdoor durability is good and films prepared from this vehicle remained unaffected on immersion in 3% sodium hydroxide at room temperature. It can be used in air drying systems and rapid baking formulations. Not recommended for brushing formulations; may be applied by spraying dipping or roller coating. Shell Chemical Corp., 50 W. 50th St., New York 20, N.Y.

SYLOID 308 makes it possible for you to realize new high standards in flatting efficiency . . . producing a modern flat finish at a lower cost. Mill room savings are increased because Syloid mill bases can be made highly concentrated with a very short grinding time. Capacity is often doubled . . . less flatting agent is required.

SYLOID 308 is a finely-sized synthetic silica of extremely high purity. Particle size is controlled to give uniformity in flatting results.

For information on how you can flatten finishes . . . economically . . . uniformly with **SYLOID 308** . . . for help on a specific problem . . . write Davison's Technical Service Department. *T. M. Reg. Applied For

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PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO GRANULATED FERTILIZERS

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- For lacquers, thinners, coatings, extenders

Celanese Solvent 203—
primary butyl alcohol solvent recommended as direct replacement for n-butanol.

Celanese Solvent 301—
low-cost replacement for ethanol-butanol or isopropanol-methyl isobutyl carbinol.

Celanese Solvent 601—
proprietary solvent with properties of MEK, but at much lower price.

Celanese Solvent 901—
high solvency, alcohol-type solvent competes favorably with butanol and higher alcohols.

Celanese n-Propyl Acetate—
90-92% concentration—economical replacement for MIBK, butyl acetate—ethyl acetate combinations, and sec-butyl acetate, in nitrocellulose lacquers.

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Solvent 203	Solvent 601
Solvent 301	Solvent 901
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n-Propanol	Isobutanol

A growing number of leading manufacturers are taking advantage of the substantial savings presented by the Celanese series of special solvents. Produced under controls that assure uniformity, these solvents meet the exacting demands of the paint and varnish industry . . . yet cost far less than standard solvents.

Compare these solvents with those commonly used in the production of varnishes, lacquers and other nitrocellulose formulations. In evaporation rate, solvent power, viscosity, blush resistance, odor . . . in every respect, Celanese solvents meet your requirements . . . and give you the excellent performance and real production economy you want.

Celanese Product Evaluation Laboratories are at your service to help you introduce these *profit column* solvents into your formulations. Write to:
Celanese Corporation of America, Chemical Division, Dept. 558-J 180 Madison Ave., New York 16, N. Y.

*Reg. U.S. Pat. Off.

Personnel Changes

U. S. STONEWARE

Frank J. Kiernan has been appointed sales engineer and will be located at the firm's New York office at 60 East 42nd St. He will bring to U. S. Stoneware a thorough knowledge of the process industries and related problems. Mr. Kiernan has specialized for a number of years in the organic and fine chemicals field. He has done work in pilot plant and semi-works production, and in research and development. He holds a BS degree in chemical engineering from the University of Detroit. He is a junior member of the American Institute of Chemical Engineers and Chemical Engineers of Greater New York.

F. J. Kiernan

A-D-M COMPANY

Albert F. Johannsen has been appointed controller and assistant treasurer. Mr. Johannsen joined ADM in 1948 as chief accountant, and was appointed controller the following year.

CENTRO

Cornelius H. Tuszynski has been appointed associate director in charge of client relations and promotional activities. He was formerly vice-president and director of Davis & Geck.

MONROE SANDER

Philip Frederick has been appointed vice-president in charge of sales promotion of the Monroe Sander Corporation of Long Island City, manufacturers of industrial finished paints, varnishes and lacquers, according to an announcement by Harold R. Tanney, vice-president and general manager of the firm. Mr. Frederick was formerly with the sales division of the Standard-Toch Chemical Company of Staten Island for fourteen years, and has been a consultant to a large number of corporations in the installation of finishing equipment.

Philip Frederick

DUPONT FINISHES

Charles P. Culp has been appointed Atlanta regional sales manager of the finishes division. He succeeds Mr. **William T. Banning** who is retiring after 37 years with the company. Mr. Culp was most recently division assistant manager of trade sales.

Other appointments in the finishes division include: **Donald V. Bauder** to assistant manager of trade sales succeeding Mr. Culp; **Lawrence M. Davis** to assistant manager of sales development succeeding Mr. Bauder, and **Robert J. Nast** to paint store superintendent succeeding Mr. Davis.

STANDARD-TOCH CHEMICALS

William Burchard Day has been elected chairman of the board following the retirement of **Mr. J. Heath Wood**, chairman since 1949. Mr. Day served mostly recently as chairman of the executive committee and has been with the company since 1908.

MERKIN

Martin B. Weinstock has been appointed treasurer, and Murray S. Williams has been named vice-president in charge of production. Mr. Weinstock has been connected with Merkin Paint for thirty years and has been secretary and assistant treasurer of the corporation since 1929. Mr. Williams joined Merkin in 1928 as factory superintendent. Both men have been active in industry affairs.

BERKELEY

Charles R. Brinkerhoff, secretary of the Millmaster Chemical Corporation, New York, has been elected a director.

Chats about Finishes

ABITOL® HELPS PREPARE BETTER ALKYD VEHICLES

by

J. O. SMALL

Sales Supervisor, Hercules' Synthetics Department

Present-day requirements for the preparation of alkyd vehicles, such as those used in self-priming flat wall paint and similar finishes, posed a problem for manufacturers until Abitol entered the picture. In preparing such vehicles, alkyds must be held until they achieve the highest possible viscosity which can be obtained in a mineral spirits dispersion of dependable stability. Under ordinary conditions the margin of safety between this point and the point of gelation is far too small. By incorporating Abitol in such syntheses, the margin is widened to make possible the preparation of alkyd vehicles better suited to modern demands.

Abitol, a high molecular weight, resinous, mono-functional, primary alcohol is unique in its efficiency in controlling molecular size in alkyds. I'll be glad to send you test samples of Abitol, and detailed information on its use. Just send me your name and address.

J O Small

HERCULES POWDER COMPANY INCORPORATED

Synthetics Dept., 926 Market St., Wilmington 99, Del.

H. J. Collyer

F. W. Barlow

CABOT

Harry J. Collyer has been appointed manager of Technical Service under Mr. Fred H. Amon, Tech-Director of the Cabot Companies. **Fred W. Barlow** has been appointed to succeed Mr. Collyer as Technical Manager of Cabot Carbon Limited, English subsidiary company. Mr. Barlow was formerly head of Cabot's Texas Research and Development Laboratories. Mr. Collyer will be concerned with the maintenance of quality control at all Cabot plants and with service to all customers on technical problems. Mr. Barlow will have similar duties at the English plant located at Ellesmere Port, near Liverpool, England.

A-D-M

J. C. Burkholder has been appointed manager of the newly opened office and warehouse in Atlanta, Ga. The office, located at 650 Murphy Ave., Southwest, will serve the states of Georgia, Florida, Alabama and South Carolina. It will handle the following products: linseed oils, soybean oils, fish oils, fatty acids, chemically modified oils, sperm oil, glycerides, fatty alcohols, and hydrogenated fatty acids. Mr. Burkholder joined Archer-Daniels in 1946 as a paint chemist. In 1949 he was made a technical sales serviceman for the southeastern part of the country.

J. C. Burkholder

INLAND

John H. Strome has been appointed sales manager and **Thomas T. Crowley** has been named assistant to the president. Mr. Strome has been with Inland Steel Container since 1950 as assistant to the president. He was formerly with the parent organization, Inland Steel Company. Mr. Crowley has been with the firm since January of this year. Prior to that, he was a steel specialist with the ECA mission in London.

GLIDDEN

James W. Fowler has been appointed industrial sales manager in Canada for the Glidden Company's paint and varnish division. He joined the firm in 1939 as an industrial sales representative.

GLYCO

B. L. Hathorne has joined the firm's staff as assistant vice-president in charge of development. Mr. Hathorne recently resigned as manager of the auxiliary products division of the Geigy Company.

PUBLICKER

Frank E. Bennett has returned to Publicker Industries Inc., and has been appointed assistant sales manager, with headquarters in Philadelphia. He was sales manager of the firm's New York office prior to serving two years with the National Production Authority as chief of the drugs, solvents and detergents branch. Mr. Bennett was a director of the War Production Board's chemical division in World War II. Prior to the war, he was president of the Bloomfield Chemical Co., of Harrison, N. J.

ARMOUR FOUNDATION

Dr. Maurrice J. Day has been named manager of the Materials and Processes Division of Armour Research Foundation of the Illinois Institute of Technology. He was formerly with the United States Steel Company at the Pittsburgh plant, serving as an metallurgical engineer. W. A. Casler, who has been acting manager of the division, continues as assistant director of research and manager of program development.

NOW THESE PAINTS DON'T DISCOLOR. Some years ago the light-colored paints produced in this plant began to discolor. After tracing the trouble to his thinner, the manufacturer switched to Sun Spirits. He has had no trouble maintaining his high standards of quality since he made this change.

4 REASONS WHY IT PAYS TO SPECIFY SUN SPIRITS

Sun Spirits is a carefully balanced product. It has good wetting-out power. Volatility is controlled to insure a rate of drying neither too fast nor too slow. Purity is checked and rechecked to make certain of a reliable, high-quality product. In new formulas, as well as old, and in testing new materials, you can rely on the uniformity and quality of Sun Spirits. For full information, get in touch with the nearest Sun Office.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO & MONTREAL

SUNOCO

NUODEX

Dr. **John R. Skeen,** formerly director of the Market Research Department of Foster D. Snell, Inc., has been appointed Vice-President in Charge of Research and Development. Dr. Skeen will work closely with Arthur Minich, previous Research head at Nuodex, who was recently made Executive Vice-President of the company. Dr. Skeen has had more than 25 years of experience in chemistry and chemical research. He was Chief of the Chemicals Branch of the Office of Civilian Supply for two years in World War II. Dr. Skeen has obtained many patents in surface coatings and other fields and his writings have appeared frequently in the chemical press. In addition to his new post, he will continue as consultant to the Economic Review Staff of N.P.A., Washington, D.C., and director of the Chemical Market Report, a Snell publication.

Dr. J. R. Skeen

U. S. RUBBER

Lawrence W. Widdecombe, Jr., and **Harold Spector** have joined the colloidal products development section of the Naugatuck Chemical Division. Mr. Widdecombe will supervise research and technical service work on latex paints at the paint laboratory. He was formerly associated with the Murale Company, Haskel, N. J. Mr. Spector will direct the division's paper laboratory, supervising research on applications of plastic latices in the paper industry.

JAMESTOWN

Robert Stewart has been appointed to the newly created post of vice-president in charge of sales of the Plastics Coating Division of Jamestown Finishing Products. Rapid growth of this phase of the company's operation created the need for the new position. Mr. Stewart served in a sales capacity with the Cotan Division for 14 years before being moved to the home office as assistant sales manager.

PABCO

William L. Keady was recently elected president and a member of the board of directors. He was formerly president of the United States Gypsum Company and the Marathon Paper Company.

William H. Lowe, former president of Pabco, was elevated to the chairmanship of the board. He replaced **Richard S. Shainwald** who becomes honorary chairman of the board of the directors.

Mr. Keady joined United States Gypsum in 1924 and successively became production manager, vice-president in charge of operations, and vice-president in charge of sales. In 1942 he was elected president of the company.

Mr. Lowe joined Pabco in 1904 and became president in 1936. He started in research and later moved to the general offices where he served as head of sales, purchasing, traffic, and advertising; vice-president and sales manager.

He is a director of Fibreboard Products, Inc., Pacific Roofing Company, H. S. Crocker Company, Inc., and The California Ink Company, Inc.

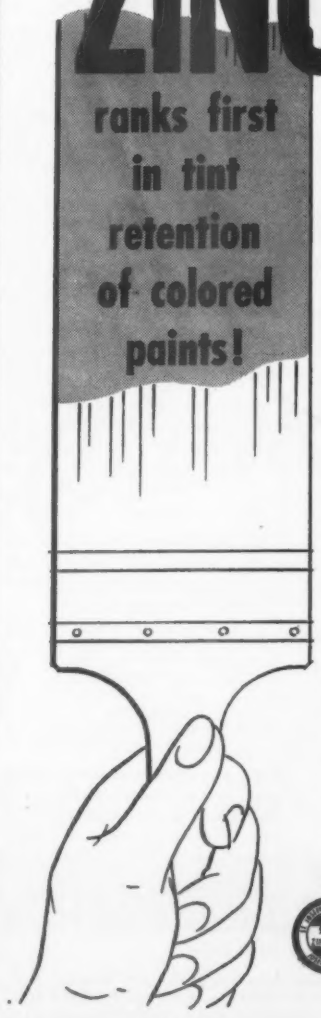
Mr. Shainwald has been associated with Pabco for 60 years having joined the firm in 1892. He started as a bookkeeper and later served in order as secretary-treasurer, assistant manager, president, and in 1936 elected chairman of the board of directors.

DU PONT

Frank H. Beadles has been named as an assistant director of sales of the Finishes Division. Mr. Beadles, who was formerly manager of the division's Plants Technical Section, will share administrative responsibilities with **Joseph B. Dietz,** assistant director of sales since 1951. Mr. Beadles joined Du Pont in 1929 as a chemist in the Philadelphia finishes laboratory. He served successively as assistant manager of the Flint, Mich., finishes plant, assistant manager of the Parlin, N. J., finishes plant, assistant regional sales manager at Chicago and section manager of the Plants Technical Section.

ZINC OXIDE

ranks first in tint retention of colored paints!



■ In order to obtain reliable data on such comparisons, an extensive program of exposure tests was carried out in England. As shown in a paper* read to the Oil and Colour Chemists' Association, zinc oxide has better tint retention properties than any of the other twelve white pigments tested. This conclusion was based upon an extensive series of experiments at six sites in different parts of the British Isles. The results definitely established the zinc oxide paints to be consistently the best, with an average tint retention as high as 75% for all of the thirteen colors tested, followed by those made from a zinc oxide/lithopone mixture, and then by those from lithopone with a tint retention of 55%.

■ ST. JOE lead-free ZINC OXIDE, by virtue of its exceptional quality and uniformity, has frequently established higher standards for products in which it is used. This superiority plus the fact that a type of St. Joe lead-free Zinc Oxide is available to meet any need is responsible for the growing use of these pigments in the consuming industries.

*See J. Oil and Colour Chemists' Association. June 1950. 33 (360), 249-69.

ST. JOSEPH LEAD COMPANY
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Plant & Laboratory, Monaca (Josephtown) Pa.

WITCO

A reorganization in the executive staff has resulted in the following appointments: **William Wishnick** to presidential assistant, **J. J. Tumpeer** to national asphalt sales manager, **B. W. Lewis** to midwest asphalt sales manager, **J. A. Raggio** to eastern asphalt sales manager, **W. F. Twombly** in charge of product development, **J. H. Wishnick** to manager of Chicago and Lawrenceville plants, **Stanley Trimble** to controller, **Thomas J. Starkie** to national chemical sales manager, **E. F. Wagner** to assistant national chemical sales manager, **C. A. Damen** to assistant vice-president of the Washington office, **M. A. Minnig** to national sales manager of rubber chemicals and H. Brubacker to assistant national sales manager of carbon black.

HILO

Eugene E. Morton, president of the Carpenter-Morton Company, has been elected president of the Hilo Varnish Company. He succeeds Carl J. Schumann who recently resigned. Mr. Morton became president of Carpenter-Morton in 1930. He has served in several industry associations. Mr. Schumann went into the varnish business in 1907. He was a long time member of the National Paint Varnish and Lacquer Ass'n and president of that group for two years.

ARTHUR D. LITTLE

John R. Kirkpatrick has been appointed to head the firm's new midwest office at the Railway Exchange Building, room 2074, St. Louis, Mo. He recently did work for Little, Inc., on behalf of the Puerto Rican government.

J. R. Yeager

P. F. Robb

H. P. Grace

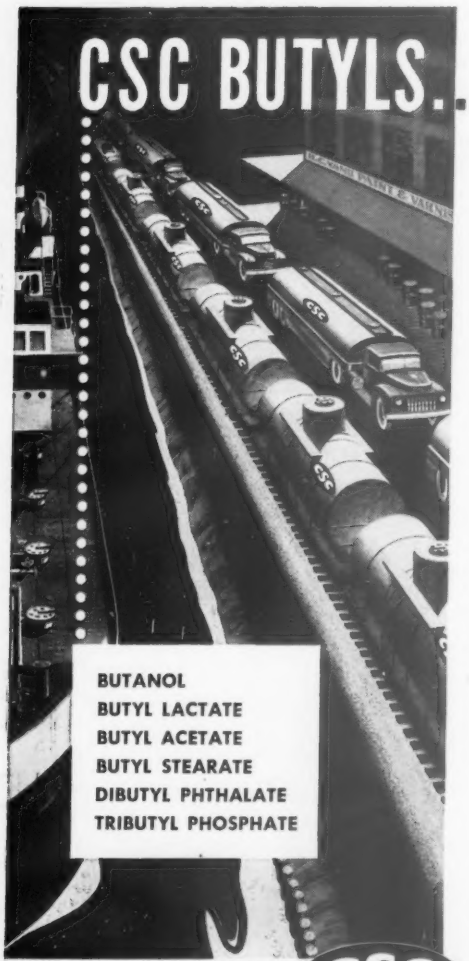
H. S. Lawton

HERCULES

James R. Yeager has been appointed manager of lacquer promotion in Wilmington, **Philip F. Robb** has been named district sales manager in New York City, **Henry P. Grace** is the new district sales manager in Detroit, and **Howard S. Lawton** has been named district sales manager in Cincinnati. Mr. Yeager managed Cellulose Products in the New York office before his new assignment. Mr. Robb joined Hercules in 1923. Prior to his new post, he was district manager in Detroit since 1936. Mr. Grace was manager of the Cincinnati territory for five years before being transferred to Detroit. He was a lacquer salesman before joining the firm in 1940. Mr. Lawton, newly appointed manager of the Cincinnati sales district, has had experience in the manufacturing and technical sales of cellulose derivatives.

TENNESSEE

Guy A. Kirton has been named assistant sales manager of the company's chemical sales division. He was previously in charge of the division's New York City sales offices. **Robert H. Cannon,** presently in charge of Tennessee Eastman's chemical sales offices in Chicago, will take over Mr. Kirton's position in New York. Decatur B. Campbell, Eastman Industrial Chemicals representative in Cleveland, Ohio will assume direction of the chemical sales division's offices in Chicago. John A. Sanders, formerly on the staff of the New York office, will replace Mr. Campell at the Cleveland office. Rawlings Hargrave from the company's sales development group in Kingsport, Tenn., will join the New York office sales staff.


CSC BUTYLS...in America's production picture
Take a good look at the butyls picture at CSC. Commercial Solvents Corporation was the first producer of Butanol by an exclusive fermentation process in 1920. Today, with greatly expanded production facilities, backed by a quarter century of know-how, CSC is still a leader in the butyls field.
Plants, warehouses and sales offices coast to coast bring CSC's butyls and butyl derivatives to industry's door. No matter what your need . . . from a drum to a tanker . . . CSC is ready to serve you promptly, efficiently.
There are still no substitutes for butyls in making the finest lacquers. Countless other uses confirm the importance of butyls in American industry:
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METAL CLEANERS
BLENDING AGENTS
SELECTIVE EXTRACTANTS
SYNTHETIC RESINS
HERBICIDES
RUBBER CHEMICALS
LUBE OIL ADDITIVES
Write, wire or phone Industrial Chemicals Division, Commercial Solvents Corporation, 260 Madison Ave., New York 16, N. Y., for full information.
BUTANOL
BUTYL LACTATE
BUTYL ACETATE
BUTYL STEARATE
DIBUTYL PHTHALATE
TRIBUTYL PHOSPHATE
INDUSTRIAL CHEMICALS DIVISION
CSC
COMMERCIAL SOLVENTS CORPORATION
ALDEHYDES • ALCOHOLS • ESTERS • AMINES • AMINOALCOHOLS
AMMONIA • NITROPARAFFINS • SOLVENTS • PLASTICIZERS • INTERMEDIATES

PATENTS

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Rain Repellent Coating

U. S. Patent 2,605,192. Thomas P. May, Washington, D. C., and Oid Davis Shreve, Chapel Hill, N. C. No Drawing. Original application June 7, 1944.

A composition capable of drying to form a water-repellent film consisting essentially of from about 3 to about 6 parts of nitrocellulose, from about 10 to about 14 parts of the glyceryl ester of hydrogenated rosin and from about 0.2 to about 1 part of a hydrophobic material selected from the group consisting of polyisobutylene of 5000 average molecular weight, paraffin and ceresin in solution in butyl acetate.

Sulfidic Pigments

U. S. Patent 2,605,167. James J. O'Brien, Baltimore, Md., assignor to The Glidden Company, Cleveland, Ohio, a Corporation of Ohio.

The method of making an improved sulfidic pigment which comprises the steps of: providing an aqueous solution of a metal sulfide selected from the group consisting of alkali metal sulfides and barium sulfide; reacting said metal sulfide solution with a water-soluble salt of a second-group metal selected from the group consisting of calcium and magnesium to precipitate an insoluble hydrate of the said second-group metal and thereby to establish in said sulfide solution an SH/OH ratio in excess of 1 to 1; separating said insoluble hydrate from its mother liquor; striking the resulting mother liquor having an SH/OH ratio in excess of 1 to 1 with an aqueous solution of a water-soluble salt of at least one pigment metal selected from the group consisting of zinc and cadmium, thereby to produce a sulfidic precipitate of the said pigment metal; and separating said sulfidic precipitate from the liquors of the strike slurry.

Polysiloxane Oils

U. S. Patent 2,604,486. Charles A. Burkhard, Alplaus, N. Y., assignor to General Electric Company, a corporation of New York.

Liquid organo-substituted polysiloxanes containing from 1.95 to 2.3 silicon-bonded organic radicals per silicon atom, said organic radicals being bonded to silicon atoms through silicon-carbon linkages, from 1 to 20 percent of said radicals being $-(CH_2)_nSCH_2COOR$ radicals wherein n is an integer from 2 to 3 and R is selected from the group consisting of hydrogen and lower alkyl radicals, the remaining silicon-bonded organic radicals being saturated monovalent hydrocarbon radicals.

Vinylbenzimidazole

U. S. Patent 2,606,175. John A. Price, Stamford, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A polymerizable composition comprising, by weight, (1) from 1% to 75% of 2-vinylbenzimidazole and (2) from 25% to 99% of a compound which is different from the compound of (1), is copolymerizable therewith and which contains a $CH_2=C<$ grouping.

Amidoester Waxes

U. S. Patent 2,607,783. Otto Turinsky, Palatine, Ill., assignor to Armour and Company, Chicago, Ill., a corporation of Illinois.

In a process for preparing an amidoester wax product, the steps of condensing about a 1 to 1 molar ratio of a

Consider also these additional factors—low cost, no need to cook, ease of formulation! You'll see why it pays to use Neville Resins!

Samples and technical data supplied promptly.

Neville Coumarone Resins and Resin Solutions are free from leaf-retarding elements and hence are in great favor for use in ready mixed aluminum paints. Actual records of paint manufacturers show excellent leafing in cases where cans have been stored five years, or even longer!

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OILS—SHINGLE STAIN • NEUTRAL • PLASTICIZING • RUBBER RECLAIMING • CREOSOTE
SOLVENTS—2-50-W HI-FLASH • CRUDE & REFINED COAL-TAR • WIRE ENAMEL THINNERS
SPECIALTIES—PHENOTHIAZINE • RUBBER COMPOUNDING MATERIALS • TAR PAINTS

P 47

saturated monobasic fatty acid containing an even number of carbon atoms within the range from 10 to 26 carbon atoms with an amine selected from the group consisting of mono and dialkanolamines containing at least 2 carbon atoms by heating said reactants to about 140 to 240° C. to from an alkylolamide, and then reacting about a 2 to 1 molar ratio of the alkylolamide with an aliphatic dibasic acid by heating said second-mentioned reactants to about 180 to 240°C. to complete the reaction.

Resinous Material

U. S. Patent 2,606,883. Fred W. Hoover, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

An air-drying oily-to-resinous ester which has a viscosity, measured in 50% solution in xylele at 25°C., of at least 0.05 poise, and in which the component radicals in per cent by weight comprise from 3% to 25% of radicals which are selected from the group consisting of allyl and methallyl and which are attached to the remainder of the ester through ether oxygen, from 10% to 50% acycilic monacyl having from eight to eighteen carbon atoms and containing at most one unsaturated linkage which, when present, is separated from the carbonyl group by at least two carbon atoms, up to 20% acyl having an ethylenic double bond adjacent to the carbonyl group, from 3% to 50% polyacyl free from acycilic unsaturation, from 15% to 40% of the residue of a polyhydric alcohol resulting from the elimination of the hydroxyl hydrogens therefrom, and up to 40% of the residue of a hydroxyacyl resulting from the elimination of hydroxyl hydrogen therefrom, each of said component radicals being different from each of the others and being composed of carbon, hydrogen and oxygen only, said components radicals which are alcoholic and said acidic radicals being present in proportions ranging from substantially chemically equivalent to a 20% excess of the alcoholic radicals.

Inorganic Pigment

U. S. Patent 2,607,705. Charles A. Kumins, Tuckahoe, N. Y., assignor to Interchemical Corporation, New York, N. Y., a corporation of Ohio.

Method of preparing a transparent cadmium sulfide pigment comprising rapidly reacting a solution of a water soluble cadmium salt not exceeding 2.3 molar concentration with a solution of a water soluble alkali sulfide not exceeding 2.3 molar concentation at temperature not exceeding 90° C., separating the precipitated cadmium sulfide from the reaction medium and preventing the growth of pigmentary aggregates, by transferring the pigment particles to a hydrophobic vehicle.

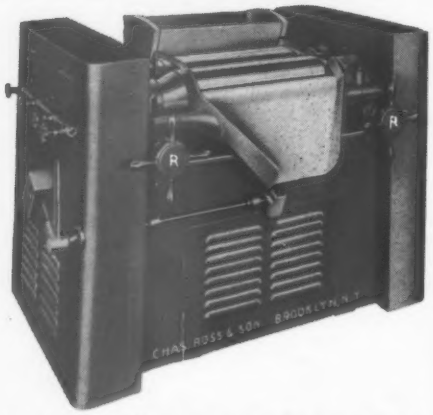
Dispersions of Polymers In Drying Oils

U. S. Patent 2,606,164. Walter A. Henson and Franklin G. Edwards, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

The method which comprises dissolving an oil-soluble emulsifying agent in a drying oil, stirring into the resulting solution an aqueous polymer dispersion, prepared by the emulsion polymerization of the corresponding unsaturated monomeric material, in an amount to contain from 10 to 50 per cent as much dispersed polymer as the weight of the oil, continuing the mixing operation until a uniform emulsion of the aqueous dispersion of polymer is obtained with the oil as the continuous phase, and dehydrating the polymer dispersion-in-oil composition before it is applied as a surface coating.

Ross

HIGH SPEED MILLS WILL CUT YOUR PRODUCTION COSTS



NEW ROSS #52T—THREE ROLL MILLS prove time and again to give maximum output with highest quality grinding or dispersion results.

The ease of operation, increased production features, and rugged construction of ROSS mills are worth investigating to see why ROSS is the leading mill in plants throughout the country.

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1. Highest grade rolls precision ground and tested for maximum hardness. Thin wall construction with large full length cooling chambers.
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5. Motor mounted inside mill frame. Two speed motors when required.
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abstracts

Tests on Collapsible Tube Finishes

Menard, D. F., Wheeling Stamping Co., Wheeling, Va. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

The types of metal used and the manufacture of collapsible tubes are discussed, together with their pharmaceutical and industrial use. The method of coating tubes and the types of coating are described. The physical and chemical tests used for evaluation of these coatings and printing inks are described. The tests include flexibility, adhesion, and resistance to the various conditions encountered in general use.

Modification of Atlas Twin-Arc Weather-Ometer

Tamblyn, J. W. and Armstrong, G. M., Tennessee Eastman Co., Kingsport, Tenn. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

The Atlas Twin-Arc Weather-Ometer with boroscilicate-enclosed glass arcs has been modified by the addition of eight 20-watt Westinghouse fluorescent sun lamps, mounted vertically about 2 inches inside the revolving specimen rack. In this way, the short-ultraviolet content of the radiation striking the test specimens has been increased to make the total ultraviolet distribution more closely resemble that of sunlight.

Qualitative and quantitative evaluations of weathering damage in plastic specimens are discussed. A method of uniformalizing the exposures received by individual test pieces is described.

Correlation of accelerated weathering in this machine with natural weathering on the roof at Kingsport, Tenn., has proved to be better than that obtained with the unmodified Weather-Ometer.

Extraction of Varnishes With Freon 12 and Freon 22

Bolson, H. B., General Electric Co. Presented before Div. of Paint, Varnish and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

One of the problems encountered in the development of hermetic refrigerator motors was the development of electrical insulation systems compatible with the lubricants and refrigerants hermetically sealed into the system. Freon 12 or Freon 22 are normally used as refrigerants.

Because Freon 12 and Freon 22 are gases at room temperatures, it is necessary to perform extractions under pressure. A Wiley-Richardson siphon tube is used in a pressure vessel consisting of a globe from a Grouse-Hinds explosion-proof electric light fixture and a steel cover equipped with a condenser, valve, and gage. The siphon tube containing the sample is suspended below the condenser, the cover is bolted onto the glass globe, air is evacuated, and the Freon is admitted. After charging, the apparatus is heated on a water bath and cold water admitted to the condenser. The bomb is tested to withstand 300 pounds per square inch internal pressure. After extraction, the Freon is bled off, the bomb is opened, and the loss in weight and the residue are examined.

Evaluation of Paint Bonding

Max Kronstein, L. F. Delong, A. W. Norman. College of Engineering, New York University, New York, N. Y. Presented at the Div. of Paint, Varnish

(*Continued on Page 55*)

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UNIVERSAL TINTING PASTE VEHICLE

The greatest money-saver and improvement for paint manufacturers since the discovery of titanium. Our technical staff have perfected an entirely new vehicle which is a must in every paint manufacturing plant, not only because it will save the paint manufacturer hours of labor and untold loss through waste such as skinning, hardening, etc., of tinting color, but reduces the tinting color of a manufacturer to one tinting vehicle for all types grinding mediums.

This marvelous vehicle eliminates the necessity of grinding tinting colors in different vehicles to meet the demand of each particular product. Frankly, you cannot afford to be without McCloskey's No. 10510.

Imagine . . .

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STYRENATED ALKYDS
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100% TINTING COMPATABILITY WITH ALL OF THESE

Order a drum or a five-gallon container of this material at our risk.

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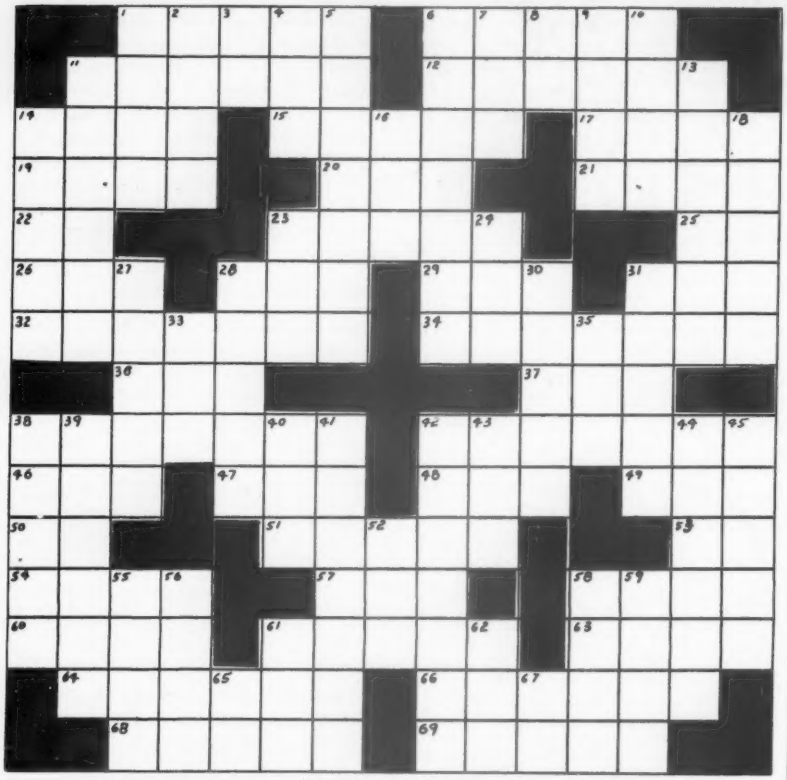
Featuring Many Terms Common to the Paint Industry



ACROSS

1. extract by soaking
6. lightens
11. color
12. extenders
14. tend
15. catches
17. Greek letter
19. state (French)
20. man's name
21. red mineral
22. about
23. source of fine brushes
25. dipthong
26. finish
28. operate
29. man's name
31. gentleman
32. monomer
34. class of hydrocarbons
36. negative
37. wrath
38. derivative of acetic acid
42. lacquer ingredient
46. blood types
47. easygoing
48. girl's name
49. French coin
50. conjuction
51. rob
53. Secret Service
54. hardness scale
57. cape
58. prepare for publication
60. so be it
61. worthless
63. type of mixer
64. acid
66. corrosive element
68. intended
69. reason

DOWN

1. part of Koran
2. waste allowance
3. equal parts (abbr)
4. elevated railroads
5. hydrocarbon
6. colorant
7. reply (abbr)
8. French article
9. God of Discord
10. portico
11. exclusive right
13. filter
14. Goddess of Agriculture
16. goal
18. love
23. able
24. protected side
27. units of force
28. active component of paint drier
30. make hole in metal
31. appears
33. painting wood will prevent this
35. open with aid of leverage
38. odor
39. chromium
40. musical notes
41. remove with solvents
42. resin with plasticizers added
43. alkyd ingredient
44. fluorescent dye
45. stiff
52. diphthong (pl)
55. ship's wheel
56. dagger (var)
58. Episcopal (abbr)
59. finished
61. defeat the opponent
62. puzzling bird
65. musical note
67. French pronoun

SOLUTION ON PAGE 65

Remove "Fish Eyes", Skins, Incidental Solids and Semi-Solids from Varnish and Lacquer with . . . .

SPARKLER FILTERS

Many varnish makers now use Sparkler Filters to clarify varnish, lacquers, and other clear liquids. The brilliance and polish obtained by filtering with Sparkler Filters is far superior to results obtained with other methods of clarifying paint products.

Our engineers are ready to give personal attention to your problems.

Model 18-S-12
Varnish Filter
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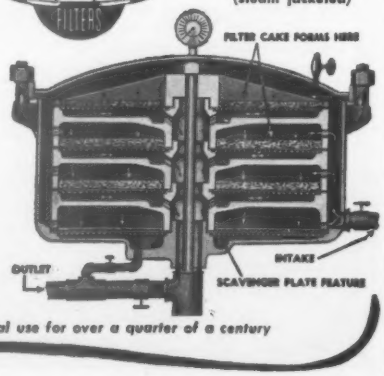

SPARKLER
MANUFACTURING COMPANY
MUNDELEIN, ILL.
Makers of fine filtration installations for industrial use for over a quarter of a century

and Plastics Chemistry of the ACS on Sept. 15, 1952 in Atlantic City, N.J.

Methods are studied for the comparative evaluation of paint bonding metal phosphate pretreatments. Four different phosphate treatments, two zinc phosphates and two iron phosphates, are applied as paint bonding bases for OD enamel TT-E-485b in three different film thicknesses and for a gilsonite test coating which is applied in two different ranges of film thickness.

The surfaces obtained from the four pretreatments are compared with the surface of the untreated steel, using the Brush analyzer. The stripping weights are determined using a hydrochloric acid-formaldehyde solution. The coated panels are compared by the combined application of salt-fog exposure and electrographic printing as described by this group in earlier papers.¶ (Ind. Eng. Chem., *42*, 1568 (1950)).

The results are presented in the form of permanent records of the printing and in the visual appearance of the panels at the end of the exposure. They indicate that the two groups—i.e., the zinc and iron phosphates—have no common stripping weight standard. Each group has its own coating effect as expressed in the stripping weight value and in its behavior as an effective paint bonding base. The paint bonding effect is seen as related to the degree of water-in solubilization produced during the application of the different phosphate treatments. This factor is currently being investigated.

DEVELOPMENT AND—

(*From page 28*)

materially aid them in using the product. Where a number of suppliers have materials for sale, similar in price and performance, the supplier having a development group capable of actively giving the consumer technical support frequently becomes the major supplier.

Pre-Production Prices

AS plant complexity increases, so do the plant investments for coatings products raw material manufacture increase, and the time span between laboratory samples and commercial production increases. But capital expenditures for new plants are predicated on customer acceptance of laboratory samples of new raw materials. When the laboratory sample is submitted for customer test work, what price (or price range) should be quoted? When pilot plant production is available, what price should be charged for the product? Should the price of pilot plant production be predicated on ultiateprice or should a pilot plant be operated on a "pay as you go" basis?

The coatings materials manufacturers, who are the actual users of the new materials put materials into formulations for prompt turn over and acceptance. They figure material costs at the "nearby" price and act accordingly. Their viewpoint puts the raw material manufacturer in the position of deciding either to (1) price according to pilot plant costs or to (2) price according to anticipated full scale costs. But pricing according to pilot plant costs, prices the material out of commercial price range for the user and decreases his incentive to "work it in"; while selling pilot plant materials at future full scale costs entails a continuing loss to the manufacturer.

The reluctance of the management groups to sell pilot plant production at what would, by normal accounting methods, be classified as a "loss" slows up the introduction of new materials. The development and research team have to collect, organize and effectively present data to motivate suitable management action in

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order to overcome this apparent impediment to transition from laboratory to plant. A full elucidation of the industrial situation and implications that the action will have on the future of a business becomes necessary at this point.

Inside and Outside Phases

The research and development procedures carried out by raw material supplier groups are the same in nature as carried out by any other research and development group. The procedure of survey, data collection, data classification, rearrangement toward an objective and filling in the gaps, have been discussed in the first four parts of this series. The span of activity of new product research and development simply covers a different industrial area from that covered by coatings materials research and development.

In the matter of raw material research and development the problems outside the laboratory are as important as the problems within the laboratory.

The outside research consists of analysis of current technical and business structure — Recognizing a new product requirement.

The inside development consists of adapting raw materials and reactions to make a product to fit the requirement.

Completing the Research and Development consists in motivating production and sales follow thru.

Research in raw materials for the coatings materials industry is thus research in industrial situations.

New Book

Lead in Modern Industry

Published by the Lead Industries Association, 420 Lexington Ave., New York 17, N.Y. Price $1.50.

"Lead in Modern Industry" is the title of a new, fully illustrated, 230 page, cloth bound book that has just been published by the Lead Industries Association. This is the only book currently available whose subject matter is devoted exclusively to the manufacture, applications and properties of lead, lead alloys and lead compounds. It was written to provide the public in general with a broad picture of the whole lead industry and, at the same time, serve as a handy reference source for those who are already using lead and its products. It is sufficiently technical to be of practical value to the engineer in industry and yet broad enough for those with a more casual interest.

The book is divided into twenty-eight chapters beginning with the history of lead, its production from mine to refined metal, and a detailed description of the various techniques for fabricating the metal into useful form. Separate chapters are devoted to the more important uses for lead including storage batteries, cable sheathing, chemical construction, plumbing, architecture, radiation protection, coatings, solders, bearing metals, ammunition, and so on through a host of other applications. The corrosion resistance of lead and its alloys and methods of using them for chemical construction are fully detailed along with the techniques for joining lead by soldering or welding (burning). Some of the more complex operations are illustrated with both drawings and photographs.

The balance of the book is devoted to the manufacture, applications and properties of industrial lead compounds including white lead, litharge, red lead, tetraethyl lead and others. White lead paints and metal protective paints are covered in detail with actual formulations given for a variety of specific applications.

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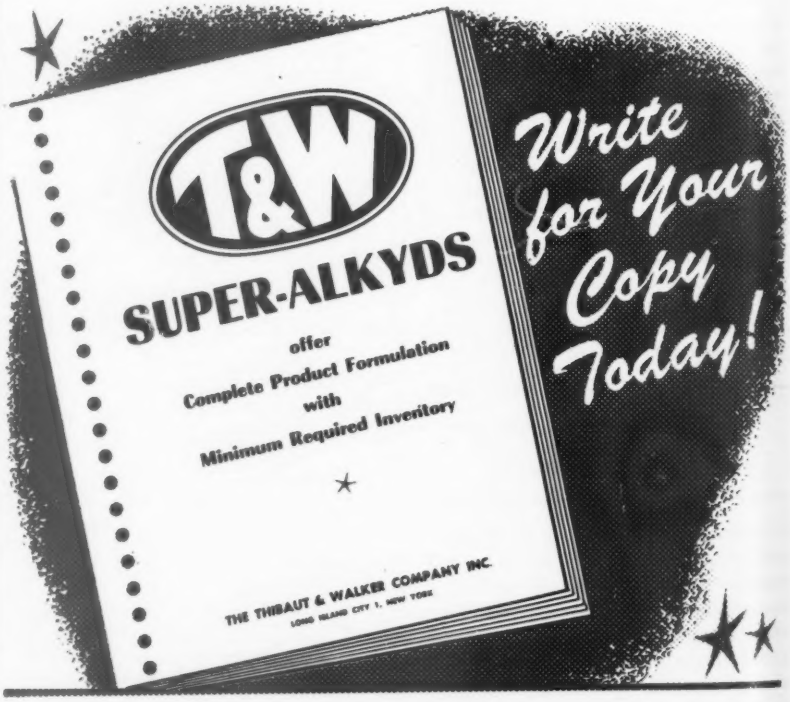

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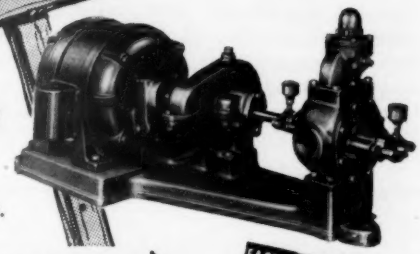

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TECHNICAL Bulletins

REZYL 50-5

Four page folder discusses the use of Rezyl Resin 50-5 in nitrocellulose furniture lacquer. Resin specifications, climatological conditions, suggested formulation, other applications, and government specification lacquers are also presented. American Cyanamid, Coating Resin Div., 30 Rockefeller Plaza, New York 20, N. Y.

COATING GAGE

Six page folder describes theory and operation of the "Coatingage" Model 600, used to measure thickness of non-magnetic coatings on magnet bases and to detect pinholes in non-conductive coatings on conductive bases. Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn.

CONTROL VALVES

16-page bulletin covers a complete review of the development of our present day conventional control valves and a look-see into the future designs of tomorrow. "New Techniques in Control Valve Design" is available from M. B. Benson, Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.

LEAD OUTLOOK

To help users of lead and lead products, the Lead Industries Association has prepared a leaflet which in a few brief pages tells why consumers in this country may depend on adequate supplies of lead in the future and explains the reasons for last year's temporary shortage. The booklet answers with reassuring facts and pictorial charts based on these facts some of the misleading or misunderstood statements made about our lead supplies and reserves in recent years.

Copies of this leaflet, singly or in quantity, may be obtained free of charge from Lead Industries Association, 420 Lexington Ave., New York 17, N. Y.

CARBON BLACK

Entitled "Carbon Black Pigments", this booklet gives a complete list of firm's line of carbon black. Pelletized black and packaging are discussed together with a brief description of black pigments for the paint, ink, plastics and paper industries. Conductivity and testing procedures are also included. A chart giving technical information of all the various carbon blacks produced by this firm is also presented. Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass.

PAINTS for HYDRAULIC STRUCTURES

The latest paint systems for the protection of hydraulic structures are published in Red Lead Technical Letter No. 7. This new eight-page bulletin contains corrosion inhibitive primers and finish paints especially formulated for exposure to moist and chemically contaminated atmospheric environments and for intermittent and continuous immersion in fresh water.

This bulletin can be obtained free of charge from the Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y.

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DERMATITIS CONTROL

Booklet presents a simple, inexpensive prevention and control program for guaranteeing personal cleanliness, protecting exposed skin areas, preventing clothing contamination, and guarding against special hazards. After outlining the problem, the booklet lists the conditions which should be checked to determine the cause of a case of dermatitis when it occurs. A six-page chart covering a wide range of industries lists various working conditions, types of dermatitis prevalent where these conditions exist, and suggested preventive measures for each. Brief descriptions of typical industrial skin troubles are included. "Control of Dermatitis in Industry" may be obtained from West Disinfecting Co., 62-16 West St., Long Island City 1, N. Y.

ACS PAINT DIV. BOOKLET

A limited number of the preprint booklet containing the majority of papers presented before the Division of Paint, Varnish and Plastics Chemistry, A.C.S. at the Fall 1952 meeting in Atlantic City, is available at $2.00 each.

The booklet is sent automatically to members of the Division. The booklet contains the papers presented at the general sessions of Paint, Plastics and Printing Inks, and also those in the three symposia: "Emulsion Polymers and Emulsion Paints;" "Adhesives"; and "Resins in Textile Finishes." Check or money order, made payable to the Division, must accompany your request. Send remittance with request to H. F. Payne, Secretary, Division of Paint, Varnish & Plastics Chemistry, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.

NITROPARAFFINS

Handling of nitroparaffins is discussed in a four-page folder issued by Commercial Solvents Corp., 260 Madison Ave., New York 16, N. Y. Important factors discussed are: flash points and flammability of vapors, toxicity, and stability.

HYDRAULIC LIFT

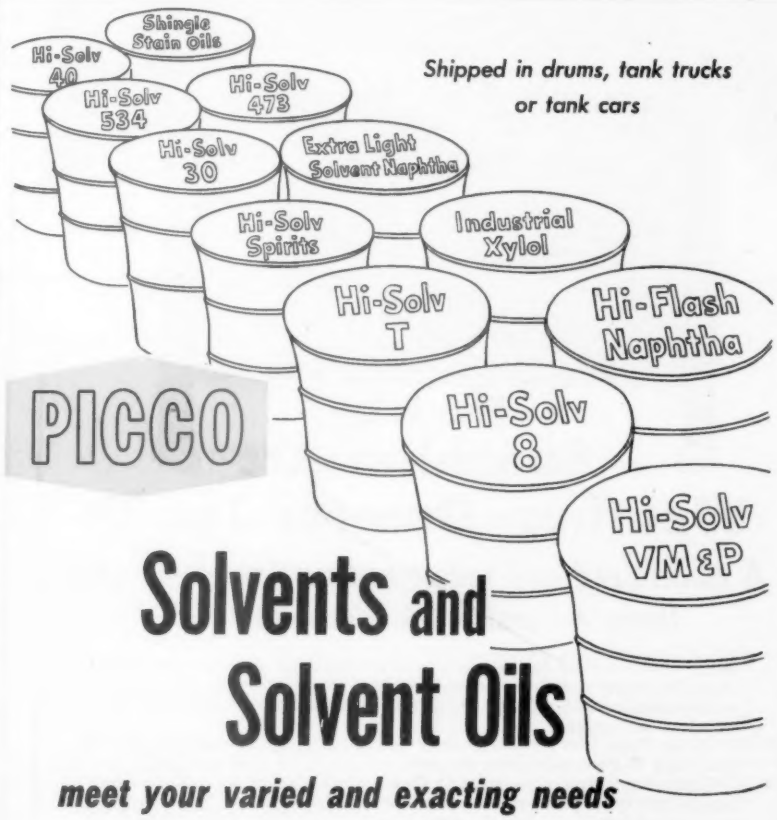
A new two-color brochure, illustrating and detailing industrial applications of the Century "1000" manually propelled hydraulic lift has been issued by the Century Products Co., Minneapolis, Minn.

The brochure outlines uses and economies of the 1000-pound capacity lift truck, describes construction features, hydraulic pump operation and lists specifications on material and design.

The literature is available from Dept. KP, Century Products Co., 5925 Highway 7, Minneapolis 16, Minn.

FLOOR FINISHES

New specifications covering finishes for floors of northern hard maple have been issued by the Timber Engineering Company, Washington, D.C. The specifications establish standards for finishes for both heavy duty and gymnasium floors and are designed to give users of these products the benefit of new improvements. Copies of the specifications can be obtained from the Maple Flooring Manufacturers Association, 548, Pure Oil Building, Chicago 1, or the Timber Engineering Company, Project F-66, 1319-18th St., N.W., Washington 6, D.C.



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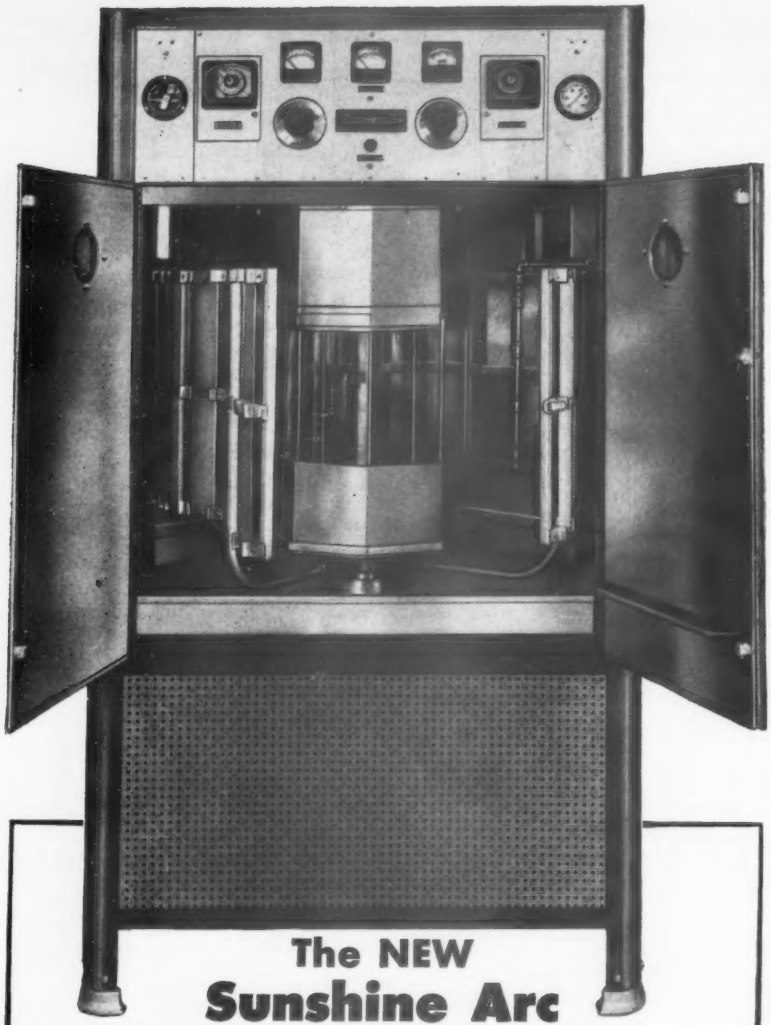

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CALENDAR OF EVENTS

Oct. 20-22. Annual Meeting of American Oil Chemists Society, Netherlands-Plaza Hotel, Cincinnati, Ohio.

Nov. 17-19. National Paint, Varnish and Lacquer Ass'n. Annual Convention, Palmer House, Chicago, Ill.

Nov. 20-22. Federation of Paint and Varnish Production Clubs Annual Meeting, Palmer House, Chicago, Ill.

Nov. 18-22. Paint Industries' Show, Palmer House, Chicago, Ill.

Production Club Meetings

Baltimore, 2nd Friday, Belvedere Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Cincinnati Club;
Dayton — Nov., Feb., April, Van Cleve Hotel;
Indianapolis — Sept., Claypoll Hotel;
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, El Jardin Restaurant, San Francisco

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Thursday, Pcikwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville. 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Building Trades Employers Assn.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 2nd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

GLYCERINE PACES

(*From page 25*)

in the presence of an alkali catalyst (6). Its molecule can be pictured as two glycerine molecules hooked together end to end by the elimination of a molecule of water from the two adjacent hydroxyl groups. Preliminary experiments on this new polyalcohol have indicated that in drying oil esters it has certain advantages over glycerine in drying time, film hardness, and soap and cold water resistance.

We can undoubtedly look forward to seeing further results in the use of this material, which, in effect, expands glycerine's properties to include those that accompany the higher-functionality alcohols.

BIBLIOGRAPHY

1. Battley, J. F.: J. Commerce, Sept. 4, 1951, p. 28
2. Gloor, M. & Wellmeroth, E.: Swiss Pat. 266,374, 1950
3. Beavers, E. M.: Proc. 22nd Ann. Convent., Soap & Glycerine Industry, Jan. 26 and 27, 1949, p. 144
4. Parker, C. H.: Paint & Varn. Prod. 42:19, April, 1952
5. Goodwin, J. T., Jr. & Hunter, M. J.: U. S. Pats. 2,584,340-4 and 589,243, 1952
6. Wittcoff, H.: Progress thru Res. 6:4, Fall, 1951

•

North American Cyanamid Expands Activities In New Montreal Plant

To meet an expanding Canadian market for industrial chemicals and pharmaceuticals, the North American Cyanamid Limited has consolidated its office and warehouse locations into one newly constructed building where it will begin production of pharmaceuticals and refining aureomycin, announced K. C. Towe, president of the American Cyanamid Company, recently.

Production at the new plant is scheduled to begin about Oct. 1, and it is hoped will decrease North American Cyanamid's dependence of many pharmaceutical items from the United States, Mr. Towe said.

The new plant is a steel frame structure measuring 104,000 square feet on a ten acre plot located at 5550 Royalmount Avenue, Montreal. The offices and manufacturing area of the new building are air conditioned.

Among the features of the new plant will be an extensive laboratory for Calco Chemical Division's products for the paint, textile, paper and leather industries, and complete quality control facilities for Lederle laboratories.

The new plant will also serve as Quebec headquarters for several other divisions of the Canadian firm.

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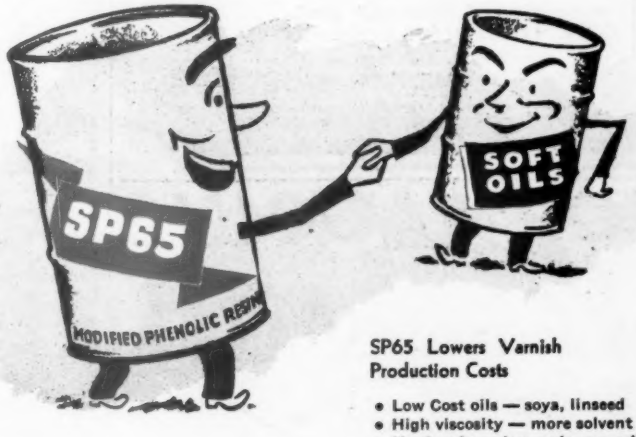

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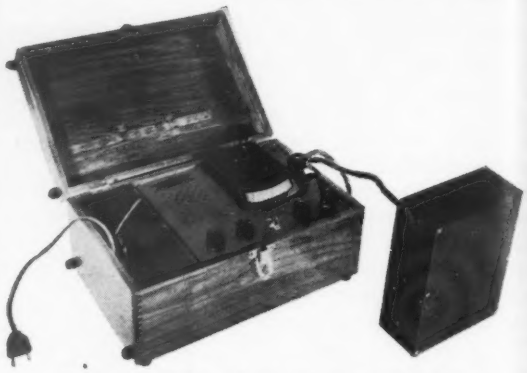

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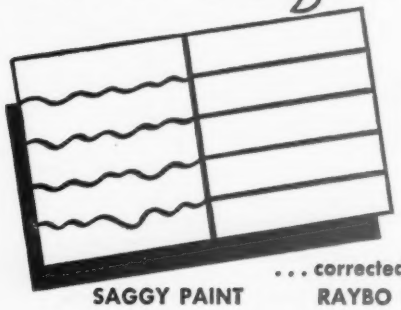

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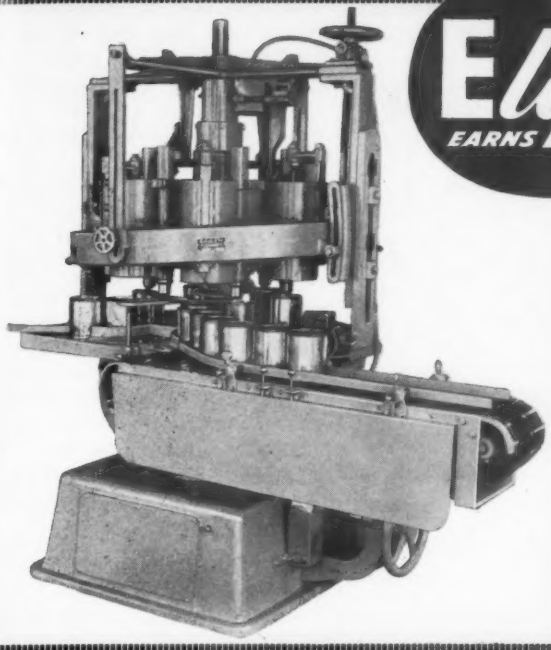

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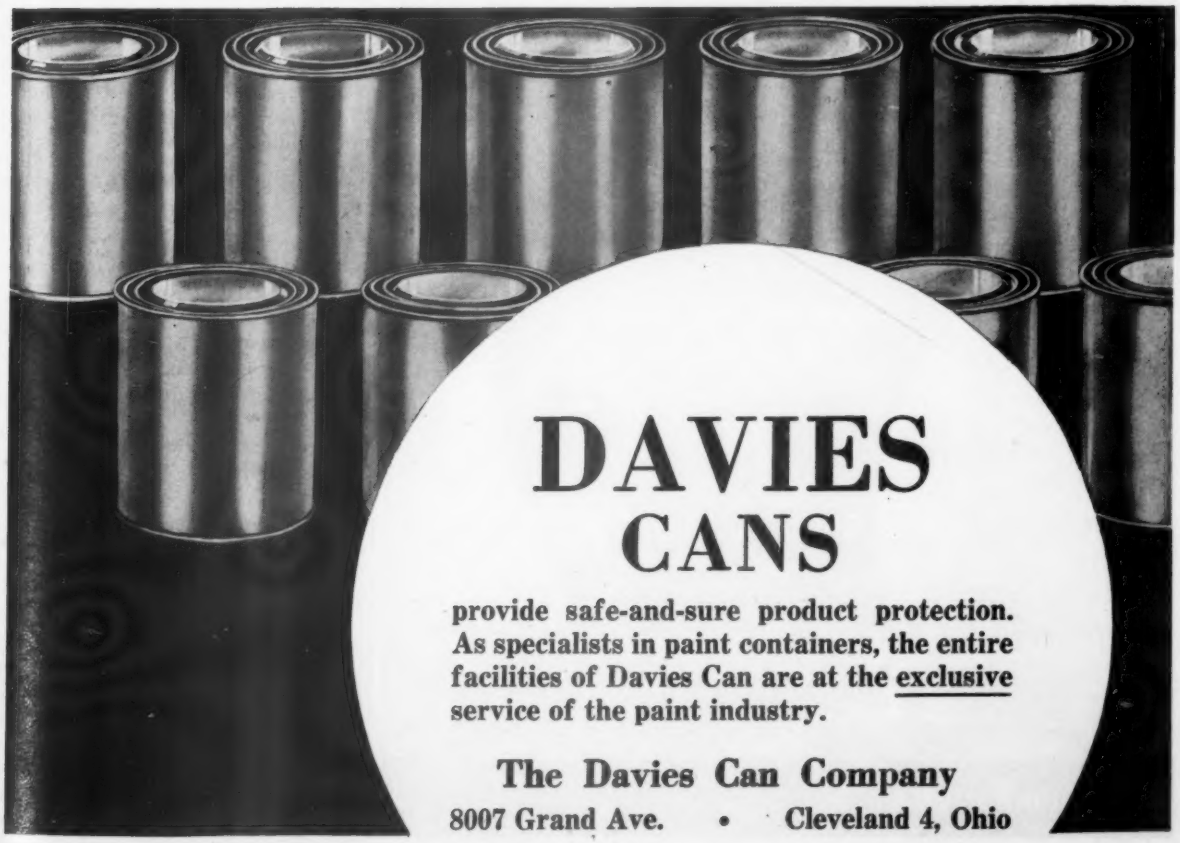

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STABILIZATION

(*From page 22*)

Cadmium salts, Barium salts and epoxy compounds are employed. The results of such activity are apparent from the data in Tables I and II.

Zinc as A Stabilizer Component

WHILE work by others in past years indicated that Zinc compounds should be useful in stabilizer applications, successful commercial application of Zinc compounds was considered impractical. However, work in the author's laboratory has proven that Zinc compounds may be used to advantage, if proper formulations are employed.

Using the principle of synergism, it was found that small amounts of Zinc soaps gave the same type of activity as some Cadmium compounds.

Several points must be kept in mind when using Zinc compounds in vinyl chloride resins: (1) It has been found that the Zinc compounds must be either soluble in the resin formulation or must have a melting point low enough to permit complete dispersion during processing. In cases where high melting inorganic salts were used, poor results were obtained. It is, therefore, best to employ organic compounds such as the octoate, laurate or ricinoleate which melt or dissolve in the vinyl formulation. (2) Only small amounts of Zinc should be used. As little as 0.25% of an 8% Zinc soap has given excellent results. (3) Either an alkaline earth metal salt or an epoxy compound should be used with the Zinc soap.

Marvel* has shown that the action of Zinc dust on polyvinyl chloride resins is to cause the removal of chlorine in pairs. Such deterioration results in cyclic propane rings giving a structure as shown in Figure 5.

Degradation of this type causes no color change in the compounded resins.

Assuming that Cadmium and Zinc compounds act in a similar manner, the excellent initial color, obtained by the use of such materials in stabilizer systems, may be explained by such activity.

However, resins containing Zinc and Cadmium compounds, when subjected to heat conditions, will change quite sharply from colorless to black, but by the use of the synergistic action of Barium soaps and Epoxy compounds, this rapid conversion is controlled to permit the advantageous use of both Cadmium and Zinc.

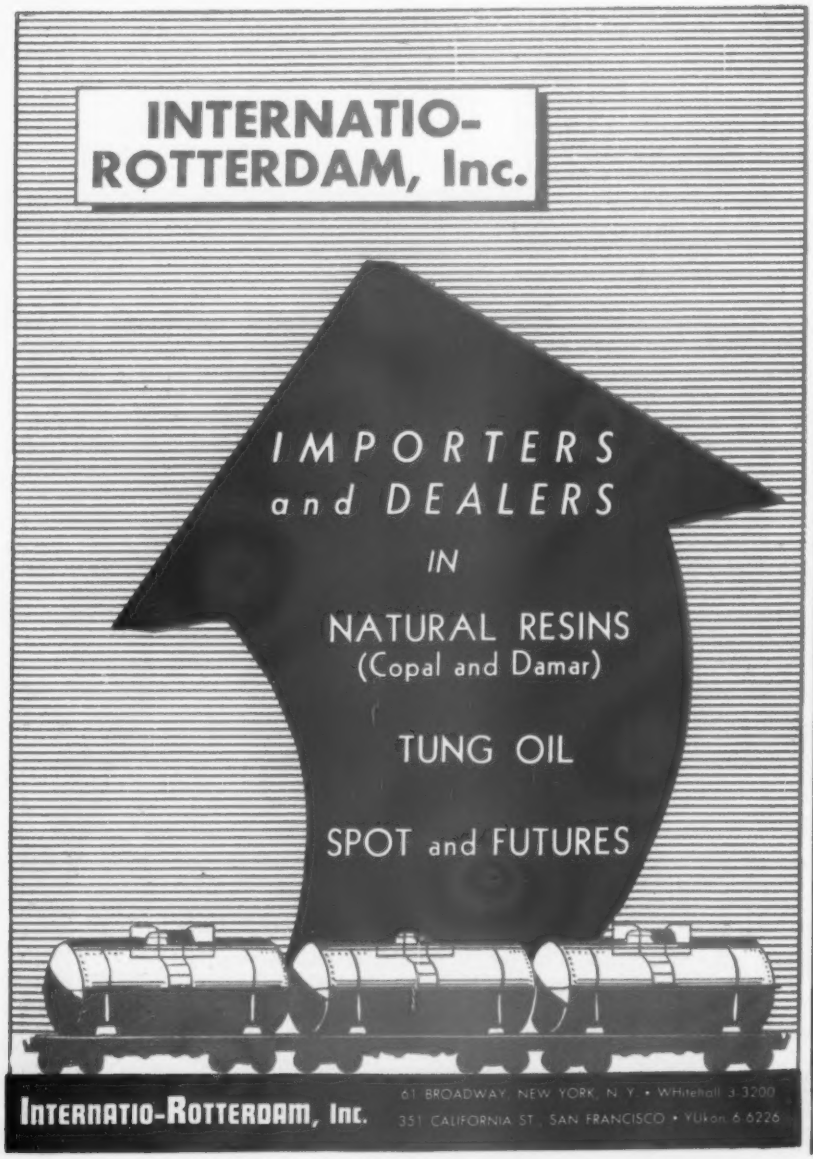
Light Stabilizers

LIGHT energy adsorption in organic materials increases the number of polyene groups increases. The energy thus absorbed may activate the degraded molecule by activation of free radicals resulting in cross linkages of resin molecules to cause embrittlement. The ability of Zinc and Cadmium compounds to promote the formation of saturated propane rings may be the explanation of their excellent light stabilizing activity. (Tables III and IV)

In the commercial application of stabilizers there is considerable confusion as to what constitutes good stabilization. This may be attributed to the following variations:

1. Differences in resin structure, which may affect both

*Marvel, C. S., Sample, J. H., and Ray, M F., J. Am. Chem. Soc., 61,3241(1939)



stability and processing characteristics.

2. The effect of plasticizers on the stability of compounded resins. Some types of plasticizers have little effect on the stability of the resin, others detract from stability, while others may assist in stabilizing resins under certain conditions.

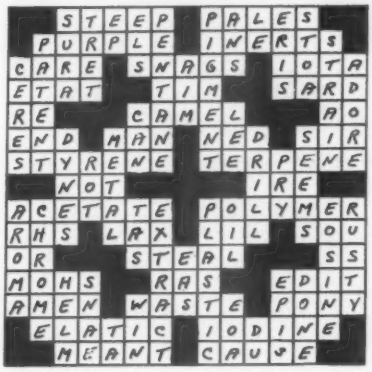
3. Processing techniques which vary widely from plant to plant. An example of such variations is rate of calendering which causes temperature variations during processing.

4. Variations in the end use of products produced from vinyl chloride resins. Thus, while the majority of such products require only heat stability to permit processing, others may require excellent light resistance.

5. Differences in opinion as to the type of stability desired. Thus, if little or no scrap is reworked in a calendering or extrusion process, it may be most practical to use a stabilizer system which gives excellent short term stability. However, in cases where the percent rework is high, some sacrifice of initial color may be necessary to obtain unusually long term heat stability.

With a realization of the strides made in recent months resulting from better understanding of the mechanism of degradation of polyvinyl chloride, we feel certain that still greater advances are possible. In fact, work now in process indicates that there are several classes of compounds which have specific synergistic activity. With improvements in their processing characteristics, it will be possible to make more general use of such materials to give improvements in both initial and long term stability and thus remove the confusion existing in stabilizer usage.

SOLUTION OF PVP CROSSWORD PUZZLE ON PAGE 54



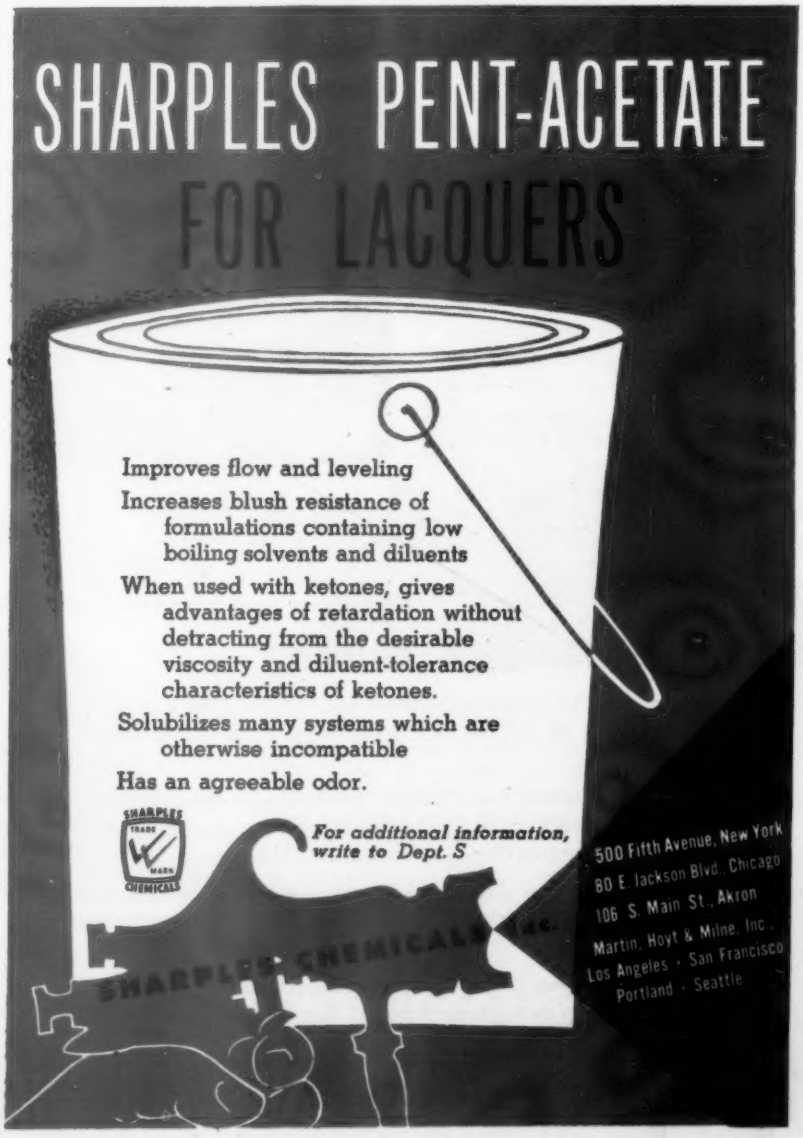
Sterling Ad Agency To Handle Oil Association's PR Program

The Industrial Division of the Sterling Advertising Agency, New York, has been appointed by the Tall Oil Association also of New York, to handle its publicity and public relations program, according to a recent Tall Oil bulletin.

The Association is composed of thirteen of the fourteen manufacturers and sellers of Tall Oil, a chemical raw material by-product in the manufacture of paper pulp.

The National Southern Products Corporation, Tuscaloosa, Alabama, is the newest member of the Association.

Their entrance into the Association was announced recently by Dernell Every, secretary of the group.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Technical Service Data Sheet

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INTRODUCTION

"Lithoform" forms a dense, zinc phosphate coating on zinc, cadmium, and galvanized surfaces—including Galvanneal, cadmium plated steel, zinc plated steel, zinc base alloys, and zinc base die castings. The "Lithoform" coating, which is non-metallic and inactive, retards reaction between alkaline metal oxide and the paint film. Peeling and loss of adhesion are thus greatly retarded on painted Lithorized zinc and cadmium.

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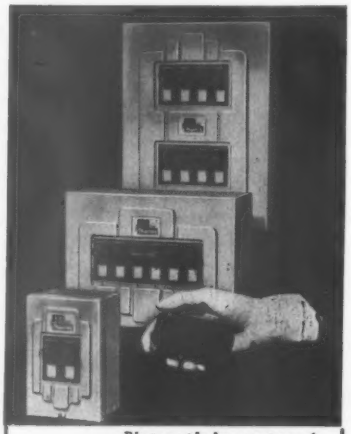

Photograph by courtesy of Murray Manufacturing Corp.

Murray Circuit Protectors are fully magnetic and provide maximum protection for both domestic and industrial wiring. Housings are of galvanized iron which is Spray Lithorized for long paint life.

THE LITHORIZING PROCESS

"Lithoform" can be applied by brushing or spraying the work with simple hand equipment, by dipping it in tanks, or by spraying it in industrial power washers.

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Spray. The spray process is the most logical one with which to coat sheets, coiled strip or duplicate products best processed on a conveyor.

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